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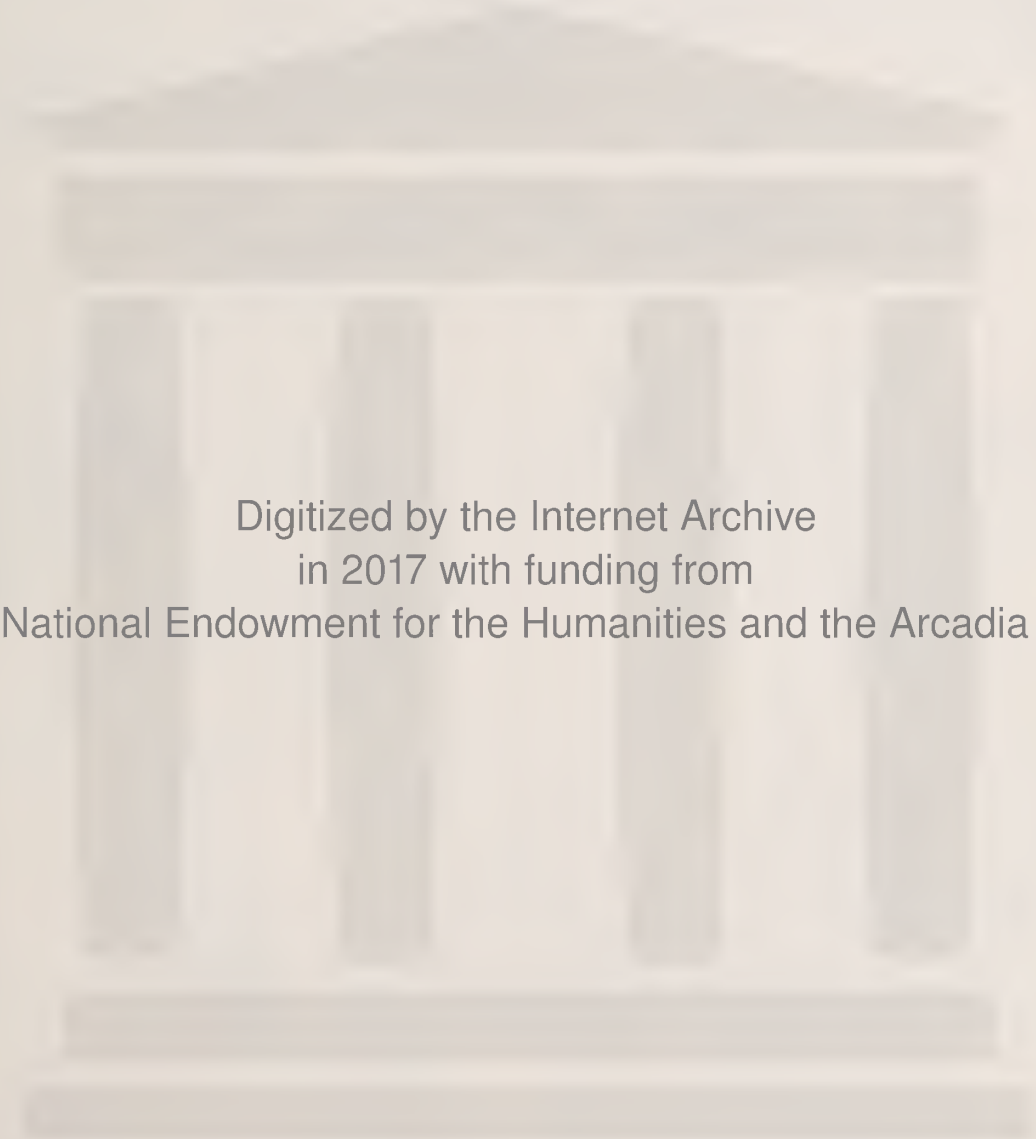

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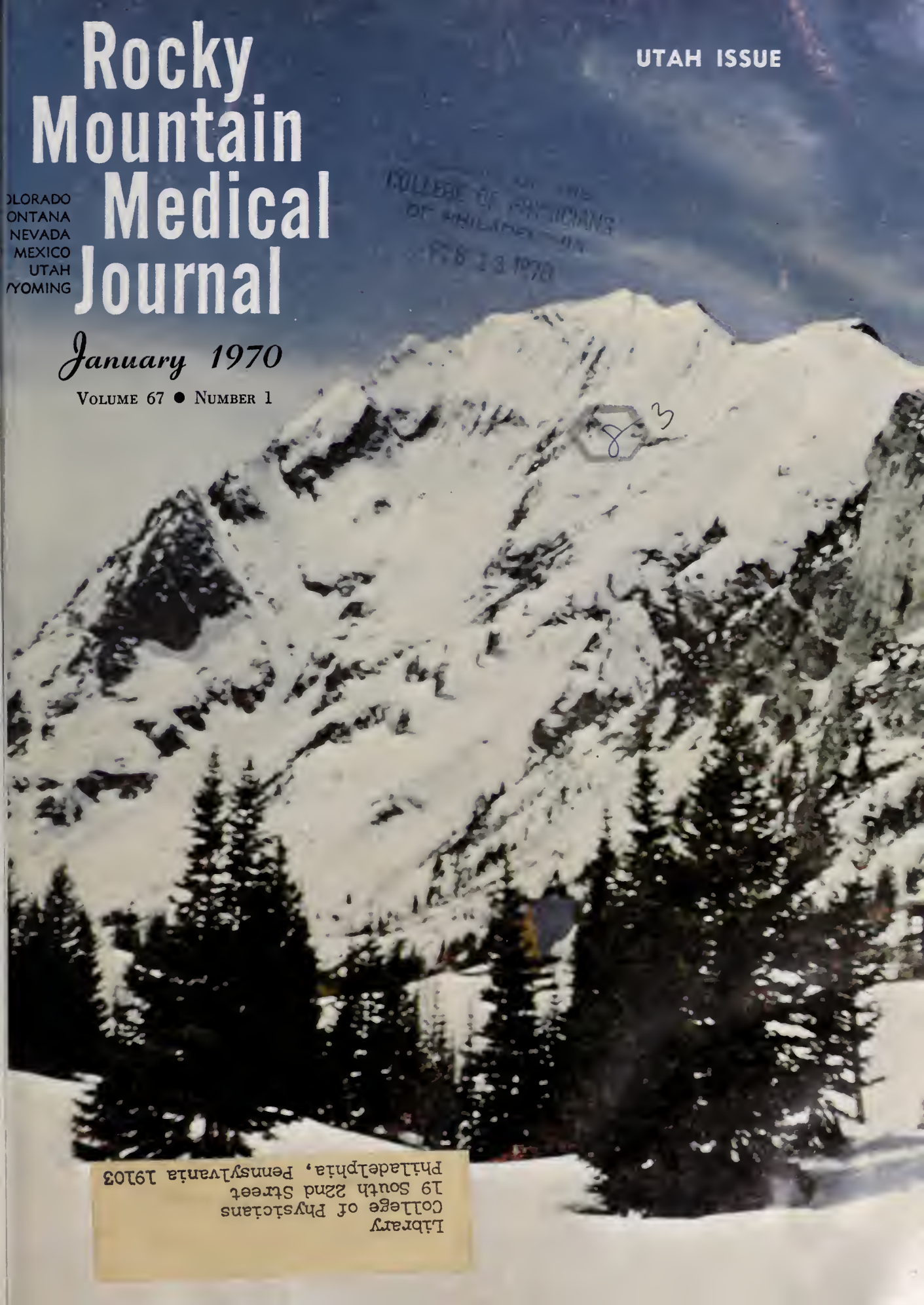

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Precautions: There have been infrequent reports of leukopenia and/or agranulocytosis and convulsive seizures. In epileptic patients, anticonvulsant medication should also be maintained. Pigmentary retinopathy may be avoided by remaining within the recommended limits of dosage. Administer cautiously to patients participating in activities requiring complete mental alertness (e.g., driving). Orthostatic hypotension is more common in females than in males. Do not use epinephrine in treating drug-induced hypotension. Daily doses in excess of 300 mg. should be used only in severe neuropsychiatric conditions.

Adverse Reactions: *Central Nervous System*—Drowsiness, especially with large doses, early in treatment; infrequently, pseudoparkinsonism and other extrapyramidal symptoms; nocturnal confusion, hyperactivity, lethargy, psychotic reactions, restlessness, and headache. *Autonomic Nervous System*—Dryness of mouth, blurred vision, constipation, nausea, vomiting, diarrhea, nasal stuffiness, and pallor. *Endocrine System*—Galactorrhea, breast engorgement, amenorrhea, inhibition of ejaculation, and peripheral edema. *Skin*—Dermatitis and skin eruptions of the urticarial type, photosensitivity. *Cardiovascular System*—Changes in the terminal portion of the electrocardiogram have been observed in some patients receiving the phenothiazine tranquilizers, including Mellaril (thioridazine). While there is no evidence at present that these changes are in any way precursors of any significant disturbance of cardiac rhythm, several sudden and unexpected deaths apparently due to cardiac arrest have occurred in patients previously showing electrocardiographic changes. The use of periodic electrocardiograms has been proposed but would appear to be of questionable value as a predictive device. *Other*—A single case described as parotid swelling.

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To the Editor:

In "What Next—Youth and Drugs" (RMMJ-Nov. 1969) Dr. Werkman misses the mark as so many others have. He concentrates on only a few of the agents. He neglects the fact that the major drugs of abuse among teenagers are the sacred cows of society—alcohol and tobacco. They also try barbiturates, "tranquilizers", spices and amphetamines, in addition to marijuana, LSD, "STP", glue or solvents, morphine and cocaine as socializing, recreational or escape agents.

The mood altering effect of cocaine is not "mind-easing" but mind-stimulating, just as are amphetamines and nicotine. The illusions or pseudohallucinations of the psychodysleptic drugs are not seen with cocaine or amphetamines as usually used. The paranoid ideation is frequently due to fear of law enforcement officials. True hallucinations resembling a paranoid psychosis or schizophrenia accompanies long term heavy use or a larger than normal dose in a regular user.

Marijuana is no less potent than alcohol in altering reaction time and mood. It causes poor attention span and impaired concentration in certain users at certain doses. This allows rapid changes of thought attention and mood. Alcohol does the same in some users. The idea of the marijuana smoker being "jumpy" and having jazzed up body functions is new to me. I would like to know the reference sources; other than the effects on heart rate and blood pressure, which are mild.

The historical aspects of marijuana are well outlined in Norman Taylor's book *Flight from Reality* (paperback—Narcotics: Nature's Dangerous Gifts, 6270 Dell) as are the histories of alcohol, tobacco, heroin, etc. The Chinese Emperor Shen Nung described the plant in his text book of pharmacy about 2737 BC. It was evidently used widely for mood alteration as religionists of the time referred to it as "Liberator of Sin." In 1952 the World Health Organization estimated 200 million persons used the drug as a mood altering agent. How extensively it is used for medical purposes cannot be determined although there are valid uses. (Mikuriya, T.: "Marijuana in Medicine—Past, Present and Future." Calif. Med. Jan. 1969.)

Dependence on any drug is due to the individual's basic personality and not a constant affect of the drug. Is psychological dependence always bad? If so, then we should have stricter control over sex, vitamins, laxatives, television, alcohol, tobacco, etc. Many more people use these agents to feel better, escape tension or escape reality than use marijuana, etc. We must remember that the agent fulfills a need for the individual and he becomes dependent on the need filling.

Dr. Werkman approaches the use of marijuana as if it were an all-or-none phenomenon. He states that the user finds the pleasure of marijuana so good that he gives up other types of pleasure seeking. For some users, as for some alcohol consumers, it may be so. This ignores the fact that the majority of users smoke marijuana for relaxation or for socializing, recreational purposes. The all-or-none thought again comes through in his saying "drugs are a way of ducking issues, hiding out or giving up." For some it may be, but not for all.

He states, "It is for this reason that sensible physicians and other professionals are against the use of drugs in teenagers." I consider myself sensible, but I include and stress the far greater physical and social costs of tobacco and alcohol.

Visually Handicapped Library Services

In the October, 1969 issue of the *Rocky Mountain Medical Journal,* the article "Colorado guide to resources for the visually handicapped" by Eugene Fleming, BA, and Robert W. Ridley, MD, noted that library services are available to the visually handicapped in Colorado at the Denver Public Library.

We wish to notify our readers that the Colorado State Library now provides these services, too.

Talking Books, tapes, Braille, and large print material are all housed in the Regional Library for the Blind and Physically Handicapped, 1332 Lincoln Street, Denver, Colorado, Telephone 892-2081 and 892-2082.

Equipment for listening to these materials may be borrowed from: Talking Book Machine Distribution Service, Colorado State Library, 1362 Lincoln Street, Denver, Colorado 80203, Telephone 892-2032.

As pertains to alcohol and tobacco we are very hypocritical regarding the law. We inform youth that it is illegal for them to purchase cigarettes before age 18. Then we place cigarette machines where all they need is a few coins to get their drug. We tell them they cannot legally drink before age 18 and then give them other messages, spoken or implied: "If you drink, hold it 'like a man'." or "If you drink don't get caught." They do not see these laws enforced nor are there any longer glaring headlines of police efforts to break up teen-age drinking parties. It becomes very easy to transpose this hypocrisy to barbiturates, amphetamines, LSD or marijuana.

The real need in our society is to offer alternatives to drug use and to give clear information about drugs and their usages. Just as we need more training in interpersonal relations, handling of anxiety and frustration, family living, and sexuality so we need more training on proper use of drugs. This involves removing the prevalent idea that one is sexy, manly, desirable, loveable, etc. if one uses a certain cigarette or alcoholic beverage. Another prevalent idea which must be changed is that there is a pill or medicine for every discomfort be it physical, psychological or social.

Becker has proposed that every college campus (and I would include high schools) have an ombudsman to counsel students on drugs. He should have had personal experience with them or close contact with others who have. His function would be to attempt to prevent drug experimentation and use. If unsuccessful in this he could counsel regarding proper methods of use.

As physicians we must offer attractive, healthy alternatives to fill the various needs met by drugs. As adults we must also offer examples of healthy, happy living. We must practice what should be preached. This includes social, racial and religious equality. It means providing equality of opportunity regardless of race, creed or color. It means fighting against man's inhumanity to man, against apathy to social change and against further dehumanization through enforced conformity.*

V. Alton Dohner, MD
Fellow in Pulmonary Diseases
University of Colorado Medical Center

*A reference list has been deleted because of space limitations—Ed.

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Precautions: Before prescribing, carefully select patients, avoiding those responsive to routine measures as well as contraindicated patients. Obtain a detailed history and a complete physical and laboratory examination, including a blood count. Patients should not exceed recommended dosage, should be closely supervised and should be warned to discontinue the drug and report immediately if fever, sore throat, or mouth lesions (symptoms of blood dyscrasia), sudden weight gain (water retention), skin reactions, black or tarry stools or other evidence of intestinal hemorrhage occur. Make complete blood counts at weekly intervals during early therapy and at 2-week intervals thereafter. Discontinue the drug immediately and institute countermeasures if the white count changes significantly, granulocytes decrease, or immature forms appear. Use greater care in the elderly and in hypertensives.

Adverse Reactions: The more common are nausea and edema. Swelling of the ankles or face may be minimized by withholding dietary salt, reduction in dosage or use of diuretics. In elderly patients and in those with hypertension the drug should be discontinued with the appearance of edema. The drug has been associated with peptic ulcer and may reactivate a latent peptic ulcer. The patient should be instructed to take doses immediately before or after meals or with milk to minimize gastric upset. Drug rash occasionally occurs. If it does, promptly discontinue the drug. Agranulocytosis, exfoliative derma-

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titis, Stevens-Johnson syndrome, Lyell's syndrome (toxic necrotizing epidermolysis),or a generalized allergic reaction similar to serum sickness may occur and require permanent withdrawal of medication. Agranulocytosis can occur suddenly in spite of regular, repeated normal white counts. Stomatitis and, rarely, salivary gland enlargement may require cessation of treatment. Such patients should not receive subsequent courses of the drug. Vomiting, vertigo and languor may occur. Leukemia and leukemoid reactions have been reported. While not definitely attributable to the drug, a causal relationship cannot be excluded. Thrombocytopenic purpura and aplastic anemia may occur. Confusional states, agitation, headache, blurred vision, optic neuritis and transient hearing loss have been reported, as have hyperglycemia, hepatitis, jaundice, hypersensitivity angiitis, pericarditis and several cases of anuria, glomerulonephritis and hematuria. With long-term use, reversible thyroid hyperplasia may occur infrequently. Moderate lowering of the red cell count due to hemodilution may occur.

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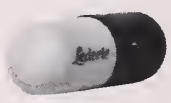

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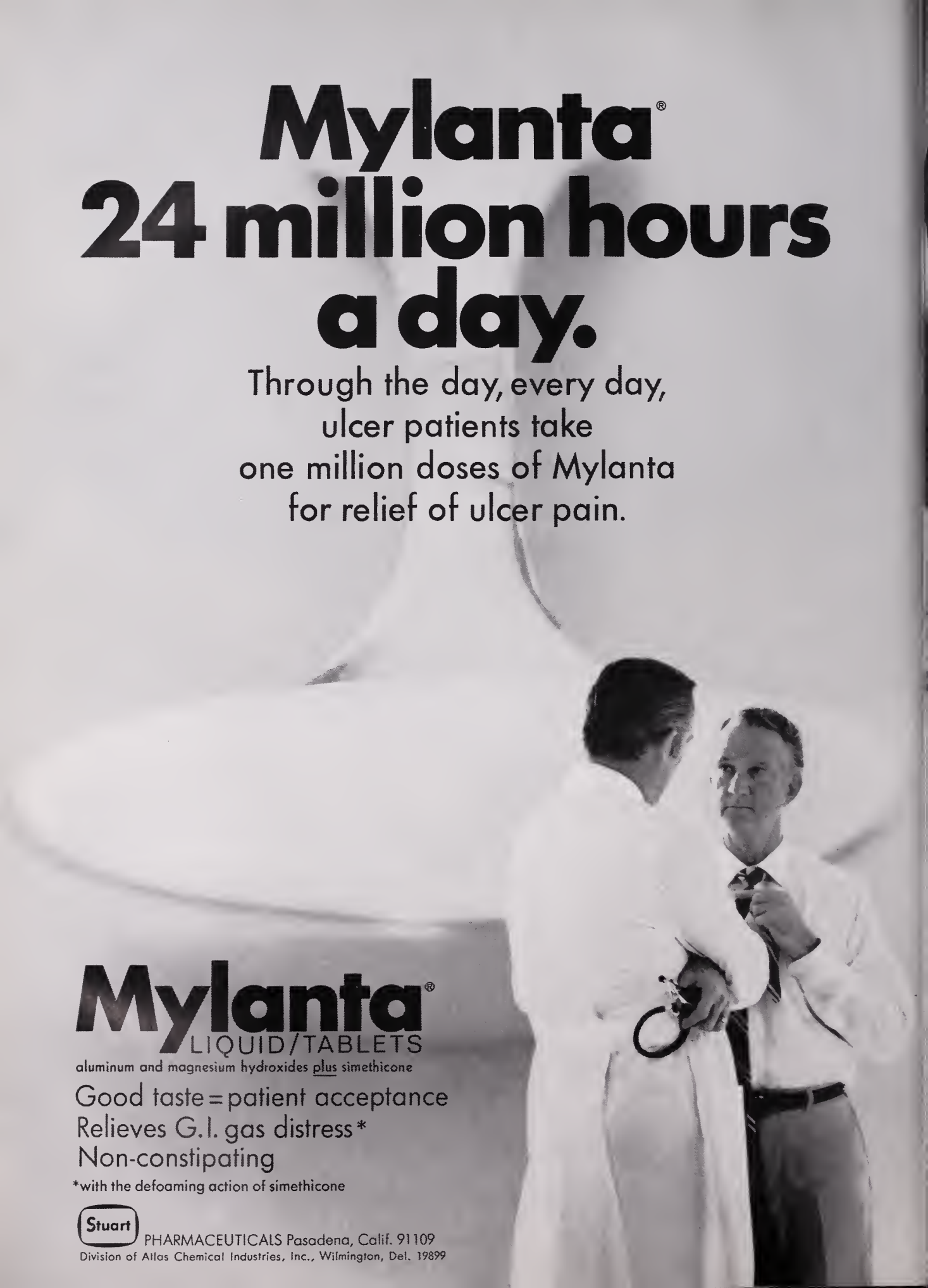

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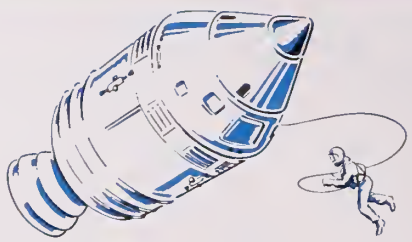

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Side Effects include drowsiness, usually transient; if persistent and associated with ataxia, usually responds to dose reduction; occasionally concomitant CNS stimulants (amphetamine, mephentermine sulfate) are desirable. Allergic or idiosyncratic reactions are rare, but such reactions, sometimes severe, can develop in patients receiving only 1 to 4 doses who have had no previous contact with meprobamate. Previous history of allergy may or may not be related to incidence of reactions. Mild reactions are characterized by itchy urticarial or erythematous maculopapular rash, generalized or confined to groin. Acute nonthrombocytopenic purpura with cutaneous petechiae, ecchymoses, peripheral edema and fever have been reported. One fatal case of bullous dermatitis following intermittent use of meprobamate with prednisolone has been reported. If allergic reaction occurs, meprobamate should be stopped and not reinstituted. Severe reactions, observed very rarely, include angioneurotic edema, bronchial spasms, fever, fainting spells, hypotensive crises (1 fatal case), anaphylaxis, stomatitis and proctitis (1 case) and hyperthermia. Treat symptomatically as with epinephrine, antihistamine and possibly hydrocortisone. Aplastic anemia (1 fatal case), thrombocytopenic purpura, agranulocytosis and hemolytic anemia have occurred rarely, almost always in presence of known toxic agents. A few cases of leukopenia, usually transient, have been reported on continuous administration.

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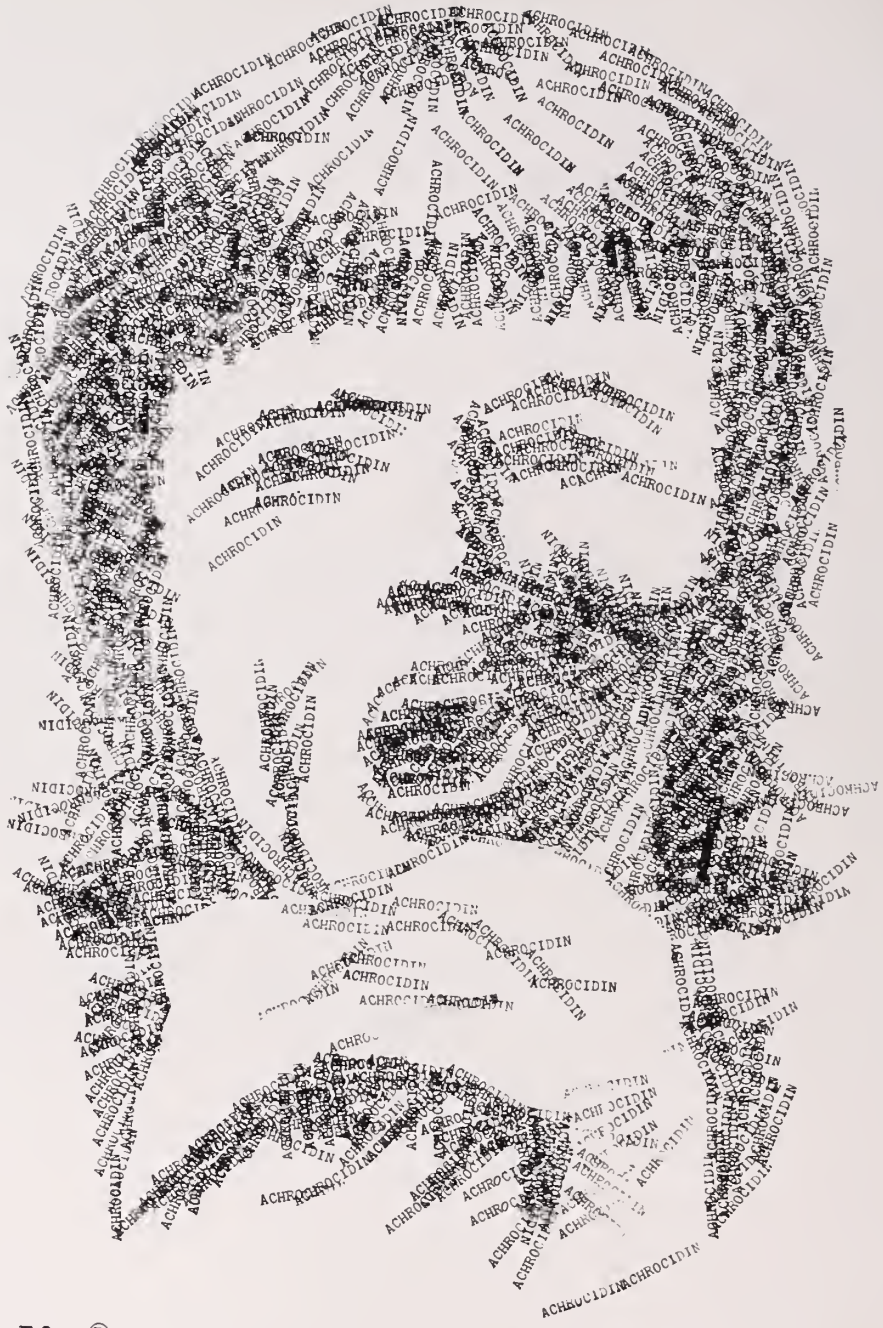

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References: (1) Salerna, L. J.; Ortiz, G., and Turkel, V.: Vaginitis: A Diagnastic and Therapeutic Approach, Scientific Exhibit, presented at the 115th Annual A.M.A. Canventian, Chicaga, Illinais, June 1966. (2) Nugent, F. B., and Myers, J. E.: Pennsylvania Med. 69:44, 1966.

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There Are Two Sides to the Coin

How easy it is to find fault with another . . . to tell the other fellow how it ought to be done. Grandstand quarterbacking has long been a favorite American pastime. Responses to TV quiz shows seem ridiculously easy, when one is the viewer and not the involved participant. It is no problem to rear children properly. Just ask any unmarried, self-appointed experts; they know all the answers.

Today's practicing physician finds himself to be the man in the arena, where the action is, and the target of the criticisms from a myriad of "grandstand experts." He must, at once, provide time to visit longer with his patients in the "folksy" manner of yesteryear, yet make his services available to more patients, many more, each hour of an already capacity-taxed day. He must keep abreast of the times in making the latest scientific equipment available for his patients' care, meet the continually-increasing wage spirals of his employees and the other increasing costs of maintaining an office (rent, insurance, supplies, taxes, etc.)—but not be guilty of raising his fees.

He must adapt his practice to new scientific discoveries, new amazing procedures and new wonder drugs—but he must not permit any of these marvelous methods to have an untoward or unexpected result. He is often asked, in fact, to guarantee results even though this is an impossibility. And then to "frost the cake" he finds himself beset with the specter of malpractice threat and suit for attempting to provide skilled care and often life-saving procedures to an unpredictable patient army.

The critic who has not devoted the years and dedication to study, training, and experience can tell him what he does wrong, how much better health care is everywhere else in the world. He must listen with monotonous regularity to the charge that this country ranks 13th in the world in infant mortality and considerably less than best in maternal mortality, heart-artery diseases and cirrhosis of the liver. He literally finds himself painted into a corner as he endeavors to cope with massive Federal health programs (in which his proposals and suggestions are to a great extent ignored). As he rolls with the punches and seeks to adapt to this situation, which has been largely created for him, he hears his best efforts labeled a "non-system" and pronounced a failure.

Fortunately, the medical coin has two sides, and the second side provides rewards and satisfactions that temper the problems of the first and provides some encouragement. So the dedicated physician persists in his efforts to practice ethically and expertly. He does not presume that he has all the answers to all the problems, but he remains open-minded, searching and viable, a credit to his profession and an interested, good citizen of his country. However, he cannot help but wonder sometimes how the "grandstand experts" would play the game if they were in it. His comfort must be the knowledge that it takes a good man to be in the game—and he continues to "fight the good fight."

Hoyt W. Brewster
Executive Director
Utah State Medical Association

Dial-P-QRS-T

Problems pertaining to the delivery of rural health care are given thoughtful consideration by Dr. Kenneth Castleton in an article of this Utah issue of the *Rocky Mountain Medical Journal.* He underscores the difficulty in obtaining young physicians who wish to practice in small communities and proposes some possible solutions.

Rural health care, however, has many facets other than supply of physicians. The need frequently arises, for example, in smaller hospitals for quick and accurate interpretation of clinical data. In this era of increasingly sophisticated electronic technology the

rapid transmission of certain types of data is now feasible.

Experience gained in the past three years with the telephone transmission of ECGs (via the Bell System's Dataphone ®) leads me to believe that such rapid transmission of data, coupled with appropriate telephone discussion between the community doctor and the consultant, can lead to greatly improved patient care. Transmission of ECGs finds its greatest value in the diagnosis of arrhythmias, particularly those acute life-threatening rhythm disorders that arise during the course of myocardial infarction. The early diagnosis of myocardial infarction itself is greatly facilitated by instant ECG transmission; the mailing of an ECG to another town and awaiting its return (three days later) can hardly lead to good initial care of the acute cardiac patient. After the initial recording of an arrhythmia, for example, the remote consultant can participate in its management and monitor the patient to assess the results of therapy. It is emphasized that verbal communication between both doctors is of the utmost importance—to the community doctor so that he may receive interpretations and therapeutic suggestions, and to the consulting physician so that he may make his interpretations within the context of the patient's whole clinical setting.

The transmission of other data has recently been demonstrated. A hospital in Idaho now sends ECG tracings to the University of Utah Medical Center for interpretation. The Intermountain Regional Medical Program has also recently instituted a trial project wherein they read all ECGs via telephone transmission from a small community hospital.

The arrhythmia illustrated in this month's "What's the Rhythm?" (page .....) was transmitted via Dataphone. Rapid understanding of the patient's clinical problem and instantaneous visualization of the rhythm disorder allowed the consultant to give advice that led to rapid improvement. Had Digitalis not been immediately withdrawn, a catastrophe might have ensued.

On-line continuous oscilloscopic monitoring of patients in coronary care units in smaller hospitals by observers at a large medical center is already a reality in Maine, under the auspices of its Regional Medical Program. Preliminary work exploring the feasibility of computer interpretations of ECGs from remote stations shows exciting promise for the future, but has not yet been sufficiently perfected for general clinical application.

Telephone transmission of ECGs, then, is considered one contribution to better medical care in smaller communities.

A. E. L.

*Are Physicians Drug-Dumb?**

DO PHYSICIANS CONTINUE to prescribe certain drugs—year after year—even though these drugs are ineffective and/or unsafe?

I'd have to answer *Yes*—if I agreed with the Food and Drug Administration's recent stepped-up drive against drugs which practicing physicians have been prescribing for years.

FDA's drive—largely against the products of research-oriented companies—comes at a time when the federal government has announced that the National Institutes of Health is reducing its research grants. Such cuts threaten to close down a number of medical research centers. Certainly, this is *not* the time to pull the rug out from under pharmaceutical companies that—the record shows—have been pioneers in research.

Or . . . could it be that the FDA is 100 percent correct and the nation's doctors are not familiar with the drugs they prescribe? I find it hard to believe that a physician would continue to use drugs—year after year—*if these drugs did not help his patients.* Yet, in net effect, that's what the FDA says has been happening.

I don't believe that doctors are drug-dumb! My vote of confidence goes to the nation's practicing physicians and their experience with drugs!

Irving Rubin, R.Ph.
Editor of Pharmacy Times

*Reprinted from November 1969 , Pharmacy Times

Cholesteatoma--a paradox*

D. Wilson Hales, MD, Ogden, Utah

Understanding the origins, the histology, and the enzyme chemistry of cholesteatoma can help control the disease at an early stage and minimize the damage.

SINCE CHOLESTEATOMA of the ear was first described by Johannes Muller in 1838, it has been observed, examined, and treated, but it has not always been understood. Though it is a benign inclusion cyst and is a localized, non-metastasizing lesion, how does it erode bone, destroy vital areas in the middle ear and regrow from the smallest remnant? Though it is benign, how does it invade the middle ear, mastoid, and surrounding structures? How does it impair hearing and damage the contents of the middle ear? These paradoxes need explaining.

Origin

A cholesteatoma can originate several ways. The origin may be different in each instance, but the pathology and end result will be the same:

1. We have all seen an epitympanic perforation or a retraction pocket or dimple in the epitympanic area (Fig. 1). Years ago otologists proposed that a vacuum developed in the middle ear and the pars flaccida was literally pulled into Prussak's space to form a pocket.[1] Recent studies suggest that the vacuum produced by eustachian tube malfunction can be augmented by fibrous bands forming as the late result of serum in the middle ear. Thickened mucosa and fibrous webs in the upper half of the middle ear can also seal off the epitympanic space and add to the retraction of the pars flaccida.[2,3]

Once the pocket forms, it continues to grow and enlarge because of these same factors. Desquamated epithelium, and debris from infection can accumulate within the balloon like sac. Moisture in such a mixture allows maceration of the skin, cellular breakdown, and discharge. The entrance of bacteria into this mixture produces a constant, odorous, annoying infection.

This argues for the adequate treatment of serous otitis and recurrent infections because of the resulting damage in neglected cases. Scarring and adhesions are the rule and lead to hearing loss and possible cholesteatoma.

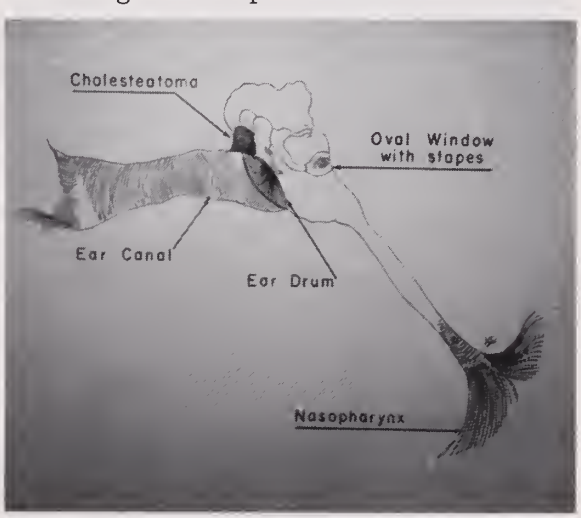

Fig. 1. Cholesteatoma arising in epitympanic perforation or pocket.

*Presented at the Utah State Medical Association meeting, Salt Lake City, September 12, 1969. The author is Assistant Clinical Professor of Surgery (Otolaryngology), University of Utah Medical School, Salt Lake City, Utah.

CASE 1

A five-year-old patient was seen years ago with a history of repeated ear infections. He had had a T & A at age 3. At age 9 bilateral myringotomies were done. Six months later he had bilateral simple mastoidectomies. Two years late, age 11, an epitympanic cholesteatoma had developed in the left ear and tympanoplasty type IV was necessary. There has been no evidence of recurrence. He was seen again at age 15 with extensive cholesteatoma involving the right ear. Radical mastoidectomy was performed and revealed another epitympanic cholesteatoma. This represents a case with bilateral, constant advancement of cholesteatoma with poor followup by the patient and where the end result was extensive bilateral surgery. Hearing is usable in the left ear; it is not usable in the right ear.

2. An origin often forgotten is the development of a cholesteatoma in the epitympanic space as a result of chronic irritation or inflammation in the canal skin near the drum. As a result of otitis externa in the roof of the canal or of prolonged otitis media in the upper half of the middle ear, the basal cells of the epidermis grow deeper, the papillae form a sheet that grows into the submucosa of the middle ear (Fig. 2). This mass will soon open up along its epidermal stalk and an epitympanic perforation is formed.[4,5] Many papers report experimental production of cholesteatomas of this type by instilling irritating chemicals in the ear canal of the laboratory animal.[6] This is a paradoxical situation where cholesteatoma develops behind an intact drum.

Many authors emphasize that chronic inflammation, thickened mucosa, and suppuration make easier the advancement or invasion of the middle ear by a cholesteatoma.

3. There has been much discussion of formation of cholesteatomas by growth of squamous epithelium through a hole in the ear drum. In the past such terms as "safe, central" perforation and "unsafe, marginal" perforations have been used. These terms are not the pat, sure euphamisms that we once thought. Often marginal perforations are present for years with no evidence of invasion (Fig. 3). On the other hand, epithelium is seen creeping in through a hole in the center of the drum and lying sheet-like on the undersurface of the drum.[4,7,8] They finally build up enough debris to cause symptoms.

This tendency of squamous epithelium to grow over mucosa of the middle ear is one of the characteristics that makes this cyst develop easily and rapidly in the middle ear. Sometimes a defect is not real squamous epithelium invasion, but is a thin, atrophic membrane being pulled inside and forming a pocket in the middle ear. This defect can be easily confused with an open perforation. Always look at the edges of the perforation, around the entire circumference, to see if it is a retracted membrane forming a little pocket underneath the drum or an open, clean perforation.

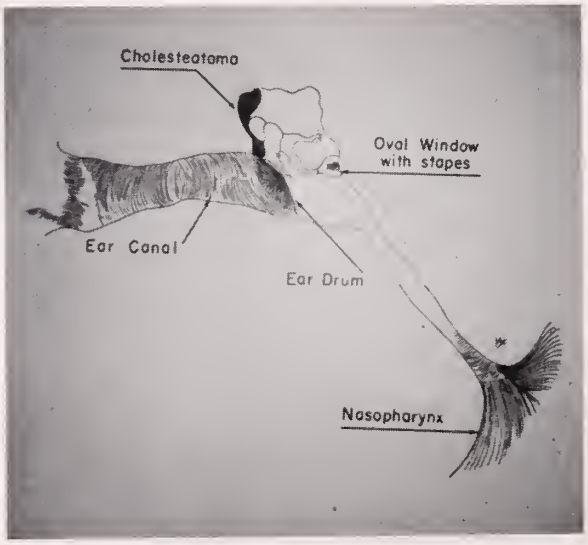

Fig. 2. Cholesteatoma arising from submucosal invasion from ear canal.

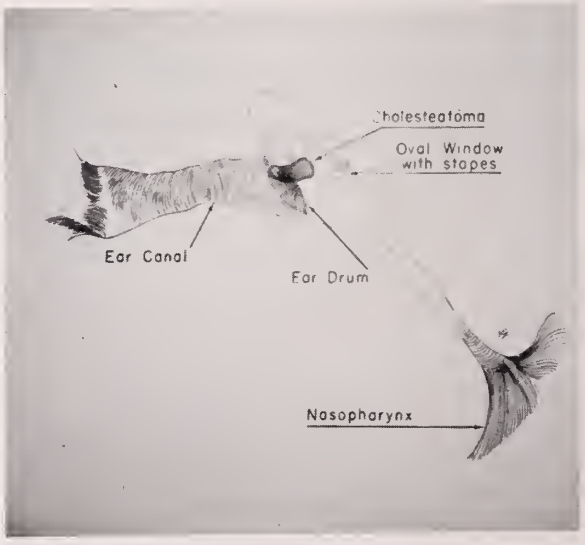

Fig. 3. Cholesteatoma growing into middle ear through a cental perforation.

CASE 2

This patient of 60 had previous ear surgery for repair of a drum perforation. The repair broke down because of hidden cholesteatoma. At surgery cholesteatoma was found in the epitympanic area surrounding the ossicles and filling the antrum. In addition to this growth, another focus was found. Squamous epithelium had grown into the middle ear over the inferior margin of the perforation and had formed a sheet like plaque on the under surface of the drum. This was separate and distinct from the cholesteatoma in the upper half of the ear. Repair was accomplished by doing a modified radical mastoidectomy with tympanoplasty type III. Repair with fascia graft under the drum and collapse of the drum on the stapes head was done. Healing has been satisfactory and serviceable hearing has resulted.

4. Cholesteatoma can also start in the middle ear as a result of cellular changes or metaplasia of the middle ear mucosa (Fig. 4). As a result of suppuration, chronic inflammation, or dessication of the mucosa, the flat, cuboidal membrane of the middle ear is transformed into a small patch of squamous epithelium.[9] This small patch then spreads, desquamates, and a cholesteatoma is formed.

5. There are occasional, rare cholesteatomas that are the result of inclusion of epidermal cells during embryonic development.[10] After lying dormant for years, these can start to develop and can result in cholesteatomas arising deep in the cranial cavity or remote areas of the temporal bone (Fig. 5). These are often called a "true" or "primary" cholesteatoma and can be explained by the "congenital rest" theory.

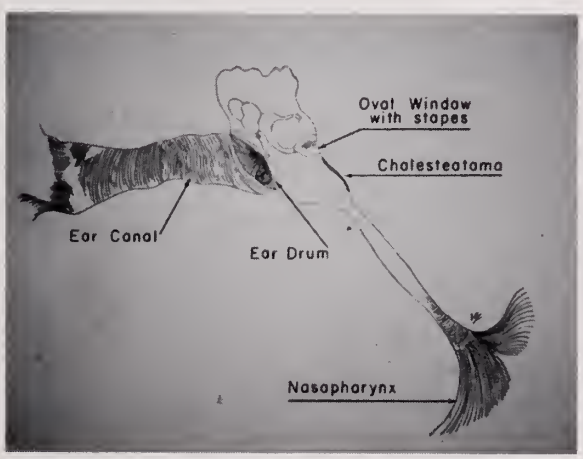

Fig. 4. Cholesteatoma arising from metaplastic mucosa in middle ear.

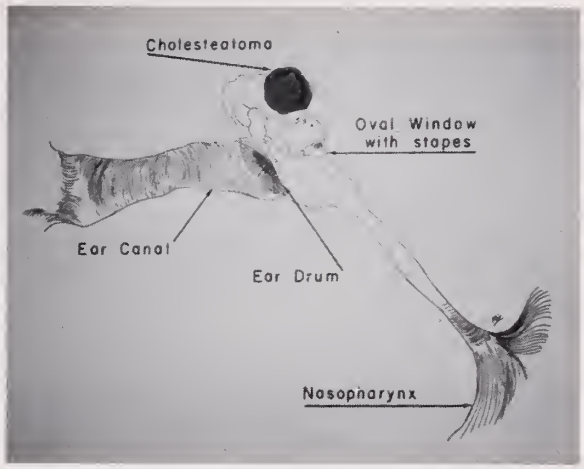

Fig. 5. Cholesteatoma arising from embryonic epidermal inclusion.

6. Finally there is a type of cholesteatoma that we see in a small group of patients. This is a small postoperative cholesteatoma, following modern middle ear reconstructive surgery. Small areas of squamous epithelium are sometimes inadvertently left behind, are covered by fascia or skin, and a cholesteatoma develops (Fig. 6). This is a true squamous epithelium inclusion cyst. It may develop in six months, or may wait years to show itself. It may be the remnant of a middle ear cholesteatoma left in a tiny bony pocket or it may be a shred of epithelium buried under a fascia graft during tympanoplasty. We must be alert to the possibility and be suspicious of any abnormality in an ear once operated. We see here another paradox—where helpful surgery can introduce new problems with it.

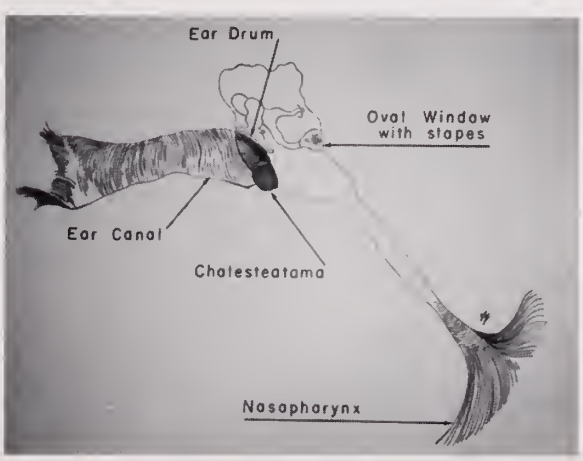

Fig. 6. Cholesteatoma arising from epidermal remnant between layers of drum following tympanoplasty.

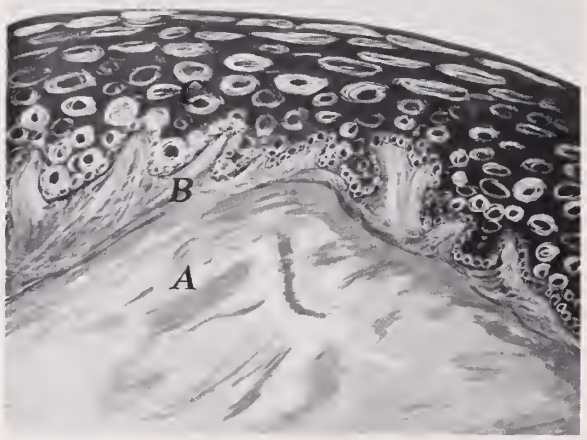

Fig. 7. Diagramatic cross-section through cholesteatoma wall.
A. Bone
B. Sub-epithelial layer
C. Epithelial layer

CASE 3

This patient had a draining ear for at least 10 years. After controlling the ear infection, tympanoplasty was advised. In December, 1967, the incus was repositioned, and the perforation was repaired with fascia graft. There was little improvement in hearing, but the perforation was closed. Revision was done in May 1969 to improve hearing. A tiny cholesteatoma was found arising from the tip of the malleus (Fig. 7). It was asymptomatic and was removed surgically. At the same time a cartilage strut was inserted with marked improvement in hearing.

CASE 4

This 40-year-old patient had a radical mastoidectomy in 1947. Intermittent discharge had been present. On examination a mobile stapes was found and a drum remnant in some areas was seen. Tympanoplasty type III was done in February, 1965, with fascia graft repair and collapse of the drum on the stapes. Improvement in hearing followed. Occasional ear infection has been treated during the last four years. On recent examination the ear drum showed a definite bulge in its lower half. In July, 1969, this area was explored and a small inclusion cyst (cholesteatoma) was found between the layers of the drum. It was removed intact and healing has been rapid.

Method of Action

What causes the cholesteatoma sac to erode and destroy bone? How can a thin, smooth membrane damage dense, compact bone in the middle ear? Destruction of bone is due to the action of a pair of protein-splitting enzymes in the sub-epithelial layer of the cholesteatoma itself. The sac wall can be separated into two layers, the epithelial and the sub-epithelial layers. (Fig. 7) The epithelial layer forms the squamous epithelium and produces the squamous debris and layering that is characteristic of the "pearl tumor." The sub-epithelial layer is in direct contact with the bone. The enzymes leucine aminopeptidase and the nonspecific esterases are concentrated in the immature fibroblasts in this zone next to the bone.[11] As the fibroblasts become more mature and migrate away from the bone, they lose much of this enzyme activity. This concentration of leucine aminopeptidase and the esterases are directly related to bone destruction and erosion.

Enzymes such as acid and alkaline phosphatase were not found in the zone next to the bone. Examination of this zone reveals no special structures involved in the destruction of bone. Elastic fibers, reticulin elements, collagen tissue, mucoproteins, mucopolysaccharides, etc., are present in varying patterns, but are not involved in the active destruction of the bone.

These two enzymes are present in high concentrations not only in the sub-epithelial layer but in granulation tissue as well. This suggests that chronic infection and chronic inflammation in any area will contain these enzymes and can thereby destroy bone and soft tissue. Controlling infection will decrease the extent of the subepithelial layer and thereby control or minimize the destructive potential. Controlling this inflammatory reaction will usually arrest or limit the growth of a cholesteatoma.

The cholesteatoma has the ability, through its sub-epithelial layer next to the bone, to destroy the tissue it touches. This is usually the wall and contents of the middle ear. The ossicles are often destroyed by their contact with the cholesteatoma. This destroys hearing. As the sac becomes larger, the medial wall of the middle ear is destroyed and a fistula in the inner ear is formed. This results in vertigo. The facial canal can be eroded and a facial paralysis results. The tegmen can be eroded with danger of meningitis, abscess, etc.

Treatment

How can formation of cholesteatoma be prevented? The answer is early treatment of ear disease and constant vigilance. This kind of care can be given by any one seeing ear problems—the family doctor, the pediatrician, the internist, the otologist. Ear infections should be treated until the ear drum and hearing return to normal. Any residual infection or inflammation can promote invasion of the middle ear by cholesteatoma. Otitis externa, especially in the very young, should be looked for, cared for promptly, and treated completely. Before treatment is completed, look for retraction in the epitympanic space for a perforation of the pars flaccida itself. Aeration of the middle ear is an important part of this treatment.

An open drum is an invitation to trouble —repeated infections, loss of hearing, and possible cholesteatoma formation. An epitympanic perforation is slower to heal over and is the most common site of invasion by squamous epithelium. Persistent central perforations, especially in the presence of chronic infections, will allow ingrowth of squamous epithelium.

Perforations of the drum will often close spontaneously once the actual infection is controlled. Where the perforation is old, or large, or fails to show evidence of spontaneous closure, nature needs some help. Sometimes cautery of the edges will help closure. More often the perforation should be closed permanently by surgery. Applying a fascia graft between or under the layers of the drum gives a solid, strong, functional drum. Meticulous surgery and the use of microsurgical technics will minimize the chance of failure or the development of late problems such as iatrogenic cholesteatoma.

Where a well developed cholesteatoma is present, surgery is the only solution.[4,9] A cholesteatoma will not cure itself. Surgery to remove, exteriorize, or evert the sac can be done. Transcanal, endaural, or post-auricular approach to the disease will allow removal and repair of the defect. Once the cholesteatoma is removed and the drum is repaired, follow-up examination is desirable over a period of years to check on the results of surgery and the health of the ear.[12]

Summary

Cholesteatoma of the middle ear can develop in many ways. Commonly it originates from an epitympanic perforation or retraction pocket as the result of chronic irritation in the ear canal next to the drum, or through invasion of the middle ear through a hole in the drum itself. Rarely, it can arise from metaplastic changes or from embryonic epidermal inclusions. Recently, cholesteatomas are seen after reconstructive middle ear surgery where squamous epithelium is left behind or buried.

The destruction of bone is due to the action of two enzymes (aminopeptidase and certain esterases) in the sub-epithelial tissue next to the bone. The paradox of a benign lesion eroding and destroying surrounding tissue is due to enzyme activity.

Prevention of cholesteatoma is early diagnosis and prompt and complete treatment of other ear problems and disease. Treatment of cholesteatoma is surgical. •

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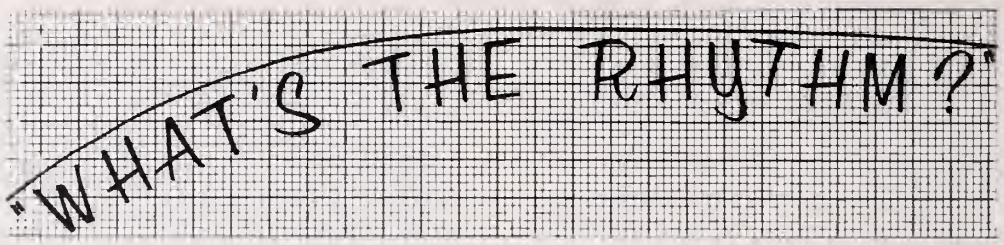
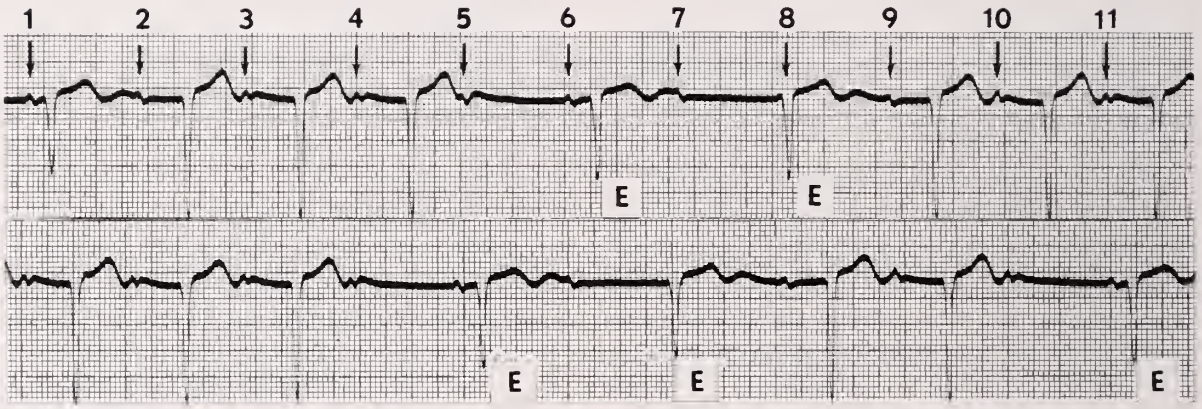


Prepared by Alan E. Lindsay, MD,* Salt Lake City



Dataphone

THE RECORDING: A continuous strip of V_1 transmitted via Dataphone ® from a transmitting station in a community hospital 300 miles away from the interpreter.

THE PATIENT: A 74-year-old woman with anorexia, vomiting, disorientation, and faintness. She had been taking an unknown amount of Digitalis for congestive heart failure.

THE TRACING: A good way to start analysis of this seemingly complex arrhythmia is to identify atrial activity. In this ECG the P-waves (arrows) are easy to identify at a rate of 74/minute. Some (the third, fourth, tenth, and 11th) are followed by QRS complexes at a long, fixed PR interval of 0.40 seconds. These we presume to be conducted beats. What goes wrong is that occasionally a P-wave is not followed by a QRS complex and a pause ensues, terminated by QRS complexes which have slightly different morphology and an inconstant relationship to P-waves in the vicinity. These are escape extrasystoles ("E") and because of their nearly normal QRS morphology and inherent pacing rate (when successive) of 40/minute, we presume that they arise from a focus in the AV junction. Note that the PR interval following the last escape beat is always slightly shorter (0.36 seconds) than succeeding PR intervals; the AV junction apparently conducts slightly better after a longer pause.

The diagnosis, then, is: sinus rhythm at a rate of 74; second degree AV block of the Mobitz II type; and escape rhythm originating from a focus in the AV junction at a rate of 40.

COMMENT: When Digitalis was withdrawn, normal AV conduction was re-established in four days, suggesting that the AV block shown above was a result of Digitalis intoxication at the level of the AV junction.

This rhythm is often mistakenly labeled as an example of Wenckebach AV block (second degree, type I). Unlike the true Wenckebach phenomenon, however, there is no progressive PR prolongation after the first two PR intervals.

The importance of identifying escape beats was pointed out on a previous communication (*Rocky Mountain Medical Journal*, 66:60 1969). Their significance as "nature's demand (or standby) electronic pacemaker" was emphasized.

The present dilemma of rural health services

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Delivery of health care to the rural areas is like the weather—Everybody talks about it but no one does anything about it. Everyone admits that it is one of the most serious problems facing the country, but no one seems to have a solution.

THE PROBLEM IS AN astonishing decline in the number of physicians in rural practice in recent years. Most of these physicians are general practitioners. Many are elderly, and as they are removed from the scene by death or retirement young doctors are not replacing them in sufficient numbers to provide the needed health care. The result is a threatened crisis in health care, already felt in some areas, which will become crucial in the next 10 or 15 years unless something is done to reverse this trend. Currently, probably less than 5 per cent of recent medical school graduates will enter general practice, and it appears that many of them who do so will practice in or near urban areas. Few will go to the rural areas where the need is greatest!

The problem is not unique to this state. Perhaps we are more aware of it here than elsewhere because of our sparse population and the great distances between doctors and between towns in some parts of our state. Many communities are in need of physicians and the problem is getting more serious. Rural doctors are searching for assistants and partners to help them carry the load, usually without success. Doctors, mayors of small towns, and private citizens are writing or calling the Medical School, the Utah State Medical Association, and hospitals with house staff in an effort to recruit young physicians just finishing their training. Legislators are angry because the communities they serve need physicians and can't get them.

One thing seems certain—a doctor for every town, hamlet and village has gone forever, but so has the need. A group of physicians can give better care to a given area than a like number of general practitioners scattered over the same area. However, there are many smaller towns that cannot support such a group, and there are towns in Utah with no physician and none within a radius of 75 miles. Someone must be available in such areas to provide first aid care, to act as a triage officer, to give immunizations, to advise on health education and family planning, and to take care of minor illnesses and minor injuries. If the town is so small that it cannot support a physician, perhaps some other type of health personnel of a lower level of training should be considered as a substitute. The question is not whether a nurse or some other type of health personnel is as good or better than a physician. The question is whether health personnel of this type are better than none at all.

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The Cause

(a) Manpower shortage: Part of the problem, but only part of it, is the current manpower shortage in the health professions, especially in medicine. There are many reasons for this shortage, but they all boil down to one main cause, namely the greater demand. Some of the reasons for the increasing demand are as follows: (1) The rapid increase in population but with uneven distribution of age groups resulting in a disproportionate number of the elderly and the young. (2) The spectacular scientific advances in medicine resulting in better treatment and more frequent cure of disease. (3) The greater affluence of the people. (4) Greater sophistication of the people regarding the benefits and availability of medical care. (5) More and better hospitals and equipment. (6) The widespread use of voluntary health insurance by employers. (7) The diversion of many physicians into fields other than private practice. (8) Medicare, Title XIX, and other governmental programs.

Productivity by physicians is increasing rapidly. The number of physicians is also increasing. But neither is increasing as rapidly as the demand for medical services.

Between 1955 and 1965 the population of the United States increased 17 per cent. During this time there was a 22 per cent increase in the number of active physicians but only 12 per cent increase in private practice. The rate of increase in the number of active physicians is currently slightly greater than the increase in population. In 1955 approximately 7,000 physicians graduated from United States medical schools. In 1965 the total had increased to only 7,400. In 1968 it was approximately 7,900, and this June was about 8,000. It is anticipated that by 1975 there will be approximately 10,000 graduates each year.

(b) Maldistribution: There is little doubt that the shortage is accentuated by a maldistribution. Doctors tend to settle in urban areas where the need is usually less than in rural areas.

(c) Urbanization: With the astonishing trend toward urbanization in recent years there is a corresponding decrease in rural population. This is especially true among young people.

(d) Changes in type of practice: There is a trend away from solo practice toward group practice. In some rural areas this will have a beneficial effect.

Increased specialization is another factor. This is a natural and inevitable result of the profound scientific explosion which makes it impossible for physicians to be well informed in all fields of medicine. Medical students realize this and tend to gravitate into specialized work because of their own feeling of inadequacy to function well as general practitioners.

(e) Physical facilities: Many rural physicians complain of the inadequacy of hospital facilities and equipment. Hospitals cannot be located in every small town nor should they be, but the physician feels that he must have good facilities if he is to provide a high quality of medical care, and he is frustrated and unhappy if he doesn't have such facilities at his disposal. All of these factors, plus the pressure of a twenty-four hour, seven day week practice, often without relief for long periods because there is no other physician within many miles, lead to frustration and unhappiness.

(f) Lack of education and cultural opportunities: Lack of professional educational opportunities for the physician is one of the commonest complaints.

Educational opportunities for the children are also important, and some rural physicians feel that their children are not getting a high quality education.

Cultural opportunities are frequently lacking.

(g) Influence of wife: The attitude of the wife is not infrequently a dominant consideration in determining where a physician goes to practice and whether he remains there.

(h) Attitude of medical educators: Medical schools are frequently blamed for "turning out specialists." Such a statement appeared recently in one of the Salt Lake papers. Anyone who has finished medical school

knows very well that medical schools *do not* turn out specialists, nor do they turn out general practitioners. At the time of graduation a medical student is a non differentiated physician who has been exposed to all the basic sciences, the clinical specialties, and many of the sub-specialties. After he receives his MD he is completely independent of the medical school. He chooses his own internship, he makes his own career plans including his decision about residency training, and he chooses his own specialty.

There is, however, abundant evidence that some faculty members try to influence medical students away from general practice. I have been told this repeatedly by former students.

Other Aspects of the Problem

(a) Demand for general practitioners: Of 1,015 physicians practicing in Utah, 267 are general practitioners. Of the forty-three requests for doctors currently on file at the office of the Utah State Medical Association from cities and towns in Utah, sixteen are for general practitioners. Several weeks ago I carefully examined all the advertisements seeking physicians in one issue of the JAMA. Of 193 requests for physicians, 86 would fall into the category of general practitioner. No other group was even close in number of requests. Earlier this year the Assembly of New York State passed a law requiring that general practice of medicine be taught as a specialty in all medical schools operated by New York State.

All of this is strong evidence of the rising tide of public pressure to solve this problem.

(b) Licensure: For many years, the problem in Utah has been accentuated by archaic and unrealistic laws regarding licensure and reciprocity. There is evidence that these laws have kept capable physicians from entering this state to practice. The new law passed by the last legislature does much to rectify this, but an outdated and unrealistic basic science law continues to operate.

(c) Foreign Medical Graduates: Another aspect of the problem relates to graduates of foreign medical schools. Each year about 7,000 graduates of foreign medical schools enter this country. Each year about 1,400 of these graduates are permitted to enter practice in this country. For a number of years now, foreign medical graduates have constituted about 17 per cent of the new physicians receiving licensure to practice in this country. Some foreign medical graduates are not well trained; others have had good training. It is unfortunate that a few of the better ones have not been granted licensure in Utah because of the almost impossible barriers which we have erected.

(d) The University of Utah College of Medicine: All medical schools are under great pressure at this time to accept larger numbers of students into medical school. Our school increased the size of the freshman class in 1965, at the time the Medical Center was opened, from 55 to 65, an increase of over 17 per cent The question now poses itself—shall we make another increase?

The question arises as to whether we should attempt to take more students even if we could solve the financial problem. Each year the number of students that graduate from the College of Medicine exceeds the practice. Granting that a great many of our number of doctors that enter the state to students go elsewhere to practice and that many physicians who come to Utah to practice were trained at other schools, we are still a "credit" state in contrast to many states that have been chronic "debtor" states. We have no assurance that if we increase the number of students more of them will stay here to practice, nor do we have any assurance that if increased numbers do stay here any or many will go into the rural areas and solve the problem which concerns us here.

Despite all this, I believe that we should increase the size of our admitting class by about 5 or 10 students, hoping that other medical schools do the same. If 100 medical schools admitted 10 additional students per year this would be equivalent to establishing 10 new medical schools of average size (100 students per class.)

Proposed Solution

The problem is far too complex for any one group or any one area to attempt to solve it alone. I would like, therefore, to propose a

nationally coordinated, research-oriented approach. By nationally coordinated I do not mean federally controlled. On the contrary, such study should be free from interference or control by any single agency or group.

Some of the components of the problem which should be approached are the following:

(a) Increase the production of physicians: This increase could be accomplished by (1) Developing new medical schools, (2) Increasing the size of admitting classes, and (3) Shortening the course in medical school.

Much has already been done but more remains to be done. During the last few years more than a dozen new medical schools have been established, and several others are in various stages of organization. Many medical schools are increasing the size of the admitting class, and others are planning to do so. Several schools are attempting to shorten the course by reducing the combined premedical-medical school course by one or even two years. Others are exploring the possibility of eliminating the internship by combining it with the residency program, with a net reduction of another year in the training period.

The increased production of physicians, however, is not the entire solution to the problem. In the first place, it is far too slow and the problems are too urgent to wait for the new schools to develop and operate. From the time that a decision is made to establish a new school, it requires a minimum of two years of planning, two years of construction, four years of training, and a year of internship, or a total of nine years before the first group of new physicians enter practice, and in most cases this time lag is 12 years.

(b) Attract more doctors to rural areas: Medical schools might admit on an experimental basis a group of candidates for medical school who have indicated their intent and desire to practice in the rural areas. For such a group the curriculum should be geared to prepare students for rural practice and should include rural preceptorships with rural general practitioners participating in the teaching program. Actually there is no indication that such a plan would work and I must admit to some skepticism. Harrell makes this comment: "Experience has indicated that the required preceptorship is not an effective recruiting device to attract medical students into rural and small town practice. Indeed, it often has a negative effect." Despite all this, however, I'm not aware of any project in which this approach has been attempted, and it might be worth trying.

Medical schools might establish satellite clinics in rural areas manned by general practitioners but with a close affiliation to the medical school. This could provide interchange of faculty and/or residents who would replace the general practitioner periodically, who then could go to the medical center for refresher courses and additional training.

Subsidies could be provided for medical students (indenture) to entice them to practice in rural areas. This could include tuition with or without living expenses. In general, the indenture plan has not worked well in a number of states including some states which are members of the Western Interstate Commission for Higher Education. Would it work if the subsidy were more liberal? Has it been given a fair trial?

Medical schools might provide really first class continuing education for doctors in a rural area on a pilot basis. This would consist of lectures and demonstrations in the home area, short courses in the medical center, dispatching consultants from the medical center to the area without cost to the doctor or the patient, provision of a good and rapid library service to the doctor, and establishing a comprehensive telephone and closed television diagnostic service.

(c) National medical service for physicians: Doctors could be assigned to rural areas with a certain amount of free choice as to location in lieu of military service, Peace Corps and Vista service for a two-year period. This would provide only temporary relief, but it may well be that the doctor would be so satisfied with the experience that he would elect to remain there after expiration of the assignment.

(d) Increase paramedical personnel: Increasing the output of new physicians alone will never solve this problem. The dramatic

increase in population, the current deficiency in numbers of physicians, and the great increase in demand and utilization of medical services, require that we not only "do more of the same" but also develop new types of "middle medical personnel" to help plug this gap. These new types of personnel should always work under the general supervision of an MD, either a qualified private practitioner in that general area of the state, or a specialist in the medical center.

At the University of Colorado Medical Center a new program is training "pediatric nurse practitioners." These are baccalaureate nurses who are given four months of special concentrated training and who are then sent out to remote rural areas where there are no physicians, where they work under general supervision of the pediatricians at the University of Colorado Medical Center.

It is interesting to note that although Russia has approximately twice as many physicians per hundred thousand people as we have in this country, there is still a great need for para-medical people such as feldshers, nurses, pharmacists, technicians, etc. Moreover, these are trained in far larger numbers than are trained in this country, showing that even with much larger supply of physicians there is still a great need for paramedical personnel and physicians.

With the change in the role of the pharmacist in recent years, it might be wise to look at this group to help solve the problem in the areas without physicians. Here is a great pool of manpower that might be better utilized rather than train new types of personnel. Such a program would involve changes in the education of the pharmacist with some exposure to both basic and clinical sciences.

Physicians' Assistants are young men, mostly former corpsmen in the armed forces, who are trained to assist physicians by assuming some of the tasks usually done by physicians, thus freeing them to see more patients and to make better use of their training. These are not being used in rural areas but it might be well to explore it. Several universities, including Duke and University of Washington, are conducting training programs in this field.

(e) Mobile Units: A program could be established to provide mobile units to take patients to the physician or hospital, and also to take medical services to patients in the remote areas. These would consist of planes, helicopters and ambulances. All should be well equipped for the administration of fluids, blood and oxygen, should include surgical instruments for such procedures as emergency tracheostomy, and should have a few simple laboratory facilities such as those needed to test urinary sugar, possibly an electrocardiographic machine and others.

Another variation of this approach would be to develop mobile vans which would be staffed by a team consisting of a doctor, nurse, technicians, possibly a dentist, and laboratory and x-ray equipment. Such a van could go out to the isolated areas on a regular schedule to give continuing care, and if medical care is provided in the area by paramedical personnel it would provide a supervisory function for them.

(f) Ambulatory Care Facilities: Establish modern ambulatory care facilities for rural physicians. In the rural areas the physician's care should be focused largely on ambulatory care.

(g) Establish a regional medical organization: (1) First aid stations could be established in rural and more remote areas as the basic unit. (2) A regional center, the next echelon, would include a well equipped hospital, equipped and staffed for most diagnostic and therapeutic procedures, and including on the staff, specialists who are qualified to perform most medical and surgical procedures. (3) Medical centers, finally, would be established in the larger cities and should include the whole gamut of specialists and equipment for comprehensive health care from the simplest to the most complicated.

Such an organization would avoid duplication of facilities and services, expensive equipment and personnel.

(h) Better use of the doctor's time: One of the great advantages of the plans as mentioned above would be that they would make

better use of the physician's time and better utilization of his training. Studies have shown that physicians spend as much as 50 per cent of their time on duties that could be done as well or better by personnel of lesser training such as nurses, technicians, secretaries, assistants, etc.

Conclusion

It is obvious to students of this problem that our present system for the delivery of health care to the rural areas is not working well. It is equally obvious that a new system must be devised. This calls for sound research on a pilot project basis and will require imagination, innovation, rational discussion and courage. Everyone resists change, yet changes will be required. It is crucial that the practicing profession cooperate in efforts to resolve the problem; otherwise changes will be thrust upon it without the benefit of its advice, counsel and expertise. The public is unhappy and is saying so. An old political axiom remains true: What the public wants it gets. •

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Certification Dates Set for Family Practitioners

The American Board of Family Practice announced that it will give its first examination for certification in various centers throughout the United States. Examinations will be held over a two-day period on February 28-March 1, 1970.

Information regarding the examination and eligibility may be obtained from Nicholas J. Pisacano, MD, Secretary-Treasurer, American Board of Family Practice, Inc., University of Kentucky Medical Center, Annex #2, Room 229, Lexington, Ky. 40506.

Anesthesia in the presence of severe anemia*

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An often repeated but seldom challenged tenet in anesthesiology is that the patient must have at least 10 gm of hemoglobin per 100 ml blood if he is safely to undergo anesthesia and surgery.[1] This tenet has become so well established that in many centers it is considered necessary to transfuse patients preoperatively if they have less than that amount of hemoglobin. However, there is little clinical or experimental evidence to test the effects of anesthesia on the anemic patient nor to establish what hemoglobin level is consistent with safe anesthesia.

In the past few years, while participating in an active renal transplant program, we have anesthetized many extremely anemic patients with renal failure who nonetheless tolerated anesthesia and surgery without special difficulty. Wondering whether the operative and postoperative course of anemic patients was any different from that in patients with normal hemoglobin levels, we examined the records of all patients with severe anemia who had been anesthetized during 1968. We selected 30 per cent hematocrit (approximately 9.5 gm of hemoglobin) as the dividing line since this represents extreme anemia at Salt Lake City (elevation 4,250 feet) where the mean hemoglobin level for normal males is 16.9±2 gm and the mean hematocrit is 49±4 per cent.[2]

*Read before the annual meeting of the Utah State Medical Association, Salt Lake City, September 12, 1969. From The Division of Anesthesiology, University of Utah College of Medicine, Salt Lake City, Utah.
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Material

During 1968 we anesthetized 82 patients whose hematocrit at the time of surgery was 30 per cent or less. These patients underwent 105 surgical procedures, 23 per cent of which were emergencies and 67 per cent of which were major in nature. Forty-four of the group were males; the age range was from 1 month to 91 years with a mean of 38 years; and the mean hematocrit was 24.5 per cent. Twenty-two of the group (27 per cent) had an hematocrit below 20 per cent. By American Society of Anesthesiologists classification standards 42 per cent were Physical Status 2; 48 per cent were 3; and 10 per cent were classified as 4.[3]

These patients fell naturally into two separate groups: those who were acutely anemic because of recent hemorrhage and those who were chronically anemic.

Acute Anemia: Twenty-two patients were acutely anemic. Of these, 15 were females; the ages ranged from 3 months to 73 years (mean 33 years); and the mean hematocrit was 25.5 per cent (range: 11-30 per cent). Their anemia was usually the result of recent or present hemorrhage (see Table 1); and because their anemia was acute, there was usually little question of building up their hematocrits to a more acceptable level prior to surgery. Operative procedures are shown in Table 2. Most of these patients (70 per cent) required emergency surgery, with 60 per cent of the procedures of a major nature. Among the anesthetics used (see Table 3), cyclopropane was the most common, being given to 54.5 per cent of the patients. Halothane was used for 36 per cent, and nitrous oxide was used as a supplement for 50 per

cent of the general anesthetics. No blood was given during surgery to 50 per cent of the patients; the rest received amounts of blood up to 3500 ml, usually in relationship to the response of the patient to the procedure or to the amount lost during surgery. There was no demonstrable relationship between the amount of blood transfused during the procedure and the preoperative hematocrit. Hematocrits of 19 patients at the time of discharge from the hospital averaged 33 per cent.

The course of the anesthetic was uneventful for 77 per cent while the chief problem encountered in the remainder was difficulty stabilizing the blood pressure. Eighty per cent of the entire group made an uneventful recovery. Pulmonary complications (atelectasis, pneumonitis, etc.) occurred in 19 per cent while 9 per cent had some posoperative nonpulmonary infection. One patient died within three days of surgery from Hodgkin's disease.

Chronic Anemia: Among the 60 patients with chronic anemia, 30 had endstage renal disease. These will be considered separately.

The 30 patients with chronic anemia unrelated to renal disease underwent 37 surgical procedures, 8 per cent of which were emergencies and 56 per cent of which were major operations. See Table 4. Seventeen of these patients were male; the ages ranged from 1 month to 91 years (mean: 46 years); and the mean hematocrit was 29 per cent (range: 24-30 per cent). The probable causes of their anemia are shown in Table 5. The anesthetic agents and technics used varied (see Table 2), with halothane being used 38 per cent of the times. Nitrous oxide was used as a supplement in 71 per cent of the general anesthetics. No blood was given to 56 per cent while the remainder received amounts up to 1500 ml. Again the amount given was in relationship to that lost during surgery and was unrelated to the preoperative hematocrit. Hematocrits of 16 patients at the time of discharge from the hospital averaged 32.8 per cent.

The anesthetic course was uneventful for 62 per cent; the remainder had blood pressure changes (including hyper- as well as hypotension). One patient had a cardiac arrest and was not resuscitated. He was a young man almost moribund from overwhelming sepsis due to an unresectable thermal gangene involving 2 extremities and part of his trunk. He was receiving nitrous oxide-oxygen for a debridement when the arrest occurred. In this instance, the anesthetic probably contributed little to his death.

Seventy per cent of these patients made an uneventful recovery. Infections accounted for postoperative complications in 4 per cent while 11 per cent had pulmonary problems of one sort or another. Two patients died in the relatively immediate postoperative period from causes unrelated to anesthesia — one from intrapulmonary hemorrhage and the other from septic shock.

Chronic Renal Disease with Associated Anemia: These 30 patients underwent 46 surgical procedures, 11 per cent of which were emergencies and 79 per cent were major procedures (see Table 6). Twenty of the patients were male; the ages ranged from 10 to 67 years (mean: 33 years); and the mean hematocrit was 21 per cent (range: 13-30 per cent). The most commonly used anesthetics were continuous epidural block or general anesthesia with halothane (see Table 2). Nitrous oxide was used as a supplement in 85 per cent of the general anesthetics. No blood was given to 65 per cent while the remainder received up to 1000 ml in proportion to the amount lost during surgery.

Sixty per cent had an uneventful anesthetic course with the chief problem in the remainder being difficulty stabilizing the blood pressure. One patient had a cardiac arrest and was successfully resuscitated. His arrest occurred shortly after induction and was probably related to the anesthetic procedure in this hyperkalemic patient. Following resuscitation, he underwent a successful renal transplant from which he recovered. Sixty-five per cent of the total group made an uneventful recovery. The most common postoperative complication was infection (in 22 per cent), probably due to the immunosuppressive therapy these patients were receiving. Pulmonary complications occurred in 6.5 per cent. Three patients died 3 to 6 weeks postoperatively from causes related to their renal disease.

TABLE 1

SOURCE OF HEMORRHAGE—ACUTE ANEMIA

Complication of pregnancy	31.8% (7 pts)
Uterus (nonpregnant)	22.7% (5 pts)
Trauma (recent)	18.1% (4 pts)
G.I. Tract	13.6% (3 pts)
Miscellaneous	13.6% (3 pts)

TABLE 3

ANESTHETICS USED

Agent or Technic	Acute pts.	Acute %	Chronic pts.	Chronic %	"Renal" pts.	"Renal" %
Halothane	8	36	14	37.8	15	32.6
Methoxyflurane	1	4.5	5	13.5	6	13.0
Cyclopropane	12	54.5	5	13.5	—	—
Conduction:						
Spinal	—	—	3	8.1	1	2.1
Epidural	—	—	—	—	16	34.7
Caudal	1	4.5	—	—	—	—
Topical	—	—	1	2.7	—	—
Field Block	—	—	—	—	1	2.1
Nerve Block	—	—	3	8.1	—	—
Miscellaneous	—	—	6	16.2	7	15.2

TABLE 4

OPERATIVE PROCEDURES

Chronic "Nonrenal" Anemia

Procedure	Major	Minor	Emergency
Superficial			
Skin graft & debridement	6		
Cheiloplasty	1		
Simple Mastectomy	1		
Herniorrhaphy	1		
Frontal Sinus Obliteration	1		
Miscellaneous		2	
Thoracic			
Thoracotomy with decortication	1		
Tracheostomy		2	1
Bronchoscopy		2	
Abdominal			
Laparotomy	1		
Bowel Resection	1		
Liver Biopsy	1		
Splenectomy	1		
Subphrenic Abscess		1	
Orthopedic			
Thoracic Laminectomy	2		1
Amputation	1		
Miscellaneous		2	
Renal			
Nephrectomy	1		
Transurethral prostatic resection	1		
Cystoscopy		3	
Gynecological			
Dilatation & curettage		2	
Radium Insertion		2	
Neurosurgical			
Craniotomy	1		
	21	16	3

TABLE 2

OPERATIVE PROCEDURES—Acute Anemia

Procedure	Major	Minor	Emergency
Superficial			
Control of Hemorrhage from Gunshot wound	1		1
Abdominal			
Laparotomy	2		2
Gastric resection and/or Splenectomy	2		2
Abd. Aneurysmectomy	1		1
Neurosurgical			
Laminectomy	1		1
Craniotomy	1		
Burr Holes	1		1
Gynecological			
C. Section	1		1
Salpingectomy	2		2
Tubal Ligation and Inc. Hernia	1		
Dilatation & Curettage		9	4
	13	9	15

TABLE 5

PROBABLE CAUSES OF CHRONIC (NONRENAL) ANEMIA

Myelogenous Diseases	26.6% (8 pts)
Tumors	20.0% (6 pts)
Trauma (past)	16.6% (5 pts)
Chronic Sepsis	10.0% (3 pts)
Chronic Bleeding	6.6% (2 pts)
Miscellaneous or Unknown	20.0% (6 pts)

TABLE 6

OPERATIVE PROCEDURES

Chronic "Renal" Anemia

Procedure	Major	Minor	Emergency
Renal			
Transplants	15		3
Exploration and/or Removal Trans.	2		1
Nephrectomy, unilateral	5		
Nephrectomy, bilateral	3		
Ureteral reimplanatation	2		
Open Renal Biopsy	3		
Cystoscopy		9	
Abdominal			
Laparotomy	3		
Appendectomy	1		1
Incisional Herniorrhaphy	1		
Cardiovascular			
Implantation of A-V Shunt		1	
	33	10	5

Discussion

The physiologic status of the anemic patient coming to surgery depends on the rate at which his red cell mass has decreased, the competency of his compensatory mechanisms, and his oxygen requirements. Acute hemorrhage with loss of as little as 30 per cent of the body's hemoglobin may provoke a profound reaction with circulatory collapse. On the other hand, with gradual loss, an otherwise normal individual can tolerate as much as 50 per cent reduction in his red cell mass with few outward effects except following exertion or excitement when his oxygen requirements rise.[4]

In acute anemia the chief pathophysiologic manifestations are caused mostly by hypovolemia. Adjustments which result from this diminished volume include decreased cardiac output and vasoconstriction with decreased tissue perfusion in addition to physiologic shunting, arterial desaturation, and acidosis. These are, in general, changes one customarily associates with shock.

Chronically anemic patients on the other hand usually have normal blood volumes. Their physiologic responses are caused by a decreased oxygen carrying capacity secondary to the decreased red cell mass.[5] Adjustments to this decreased capacity include an increased cardiac output, right shift of the oxyhemoglobin dissociation curve, decreased viscosity of the blood, and decreased peripheral resistance.[6] Some writers feel that important changes in cardiac output do not occur until the hemoglobin level has dropped to 7 gm or less.[5] In other patients, underlying disease may drastically alter ability to tolerate and compensate for the decrease in oxygen carrying capacity of the blood. Hence any one particular anemic patient may not have the above compensatory mechanisms.

In anesthetizing both types of anemic patients, the critical factor is, of course, how adequately tissue oxygenation is accomplished. The rate at which oxygen is made available to the tissues in unit time depends on the cardiac output and the arterial oxygen content, thus:

Available oxygen = cardiac output x arterial oxygen content or
= cardiac output x arterial oxygen saturation x hemoglobin concentration x 1.34[7]

The amount of oxygen available to the tissues in the normal individual ordinarily amounts to nearly 1000 ml/min. Available oxygen of 400 ml/min is said to be the lowest rate that can be tolerated for any length of time with safety.[7]

In the unanesthetized chronically anemic patient arterial saturation is usually normal at normal levels of ventilation and activity[8]; and the cardiac output may be (though not always) elevated. During a carefully managed anesthetic procedure on a chronically anemic patient, available oxygen is usually adequate. However, tissue hypoxia may result from such factors as: decreased oxygen in the inspired air; decreased oxygen tension in the arterial blood due to airway obstruction, hypoventilation, or physiologic shunting; decreased cardiac output usually due to the myocardial depressant action of the anesthetic agent; and decreased blood volume due to surgical loss.[9] Prevention of the deleterious effects of anesthesia in the anemic patient therefore requires scrupulous attention to the anesthetic technic and management, particularly observing the patient's responses. Most anemic patients can safely undergo and survive a well-conducted anesthetic.

However, it is not enough to ask whether these patients will survive anesthesia and surgery. It is also important to determine whether the anemia increases morbidity and postoperative mortality. From our experience there seems to be little difference between normal patients and those with chronic anemia with respect to their operative and postoperative course. Many were extremely sick and had involvement of multiple organ systems so that much of their operative and postoperatice morbidity was caused by this associated pathology. The only operative cardiac arrest in the series that was at all causally associated with the anesthetic itself was not due to

the anemia but rather to severe hyperkalemia in an undialyzed anephric patient. Occurrence of postoperative pulmonary complications was not unusually frequent, comparing well with the over-all incidence of such complications quoted in other reviews.[10,11] That a normal hemoglobin level is necessary for good wound healing is a tenet held by some surgeons. Clinical impressions of the validity of this belief vary as do reports of experiments on animals.[12,13] In a retrospective study such as this, we have no information on the wound healing among our patients. Except in the group of patients receiving immunosuppressive therapy, postoperative infections were not any more common than among average surgical patients. And all postoperative deaths seemed to be due to other pathology than the anemia.

The question invariably is raised: why not transfuse these patients preoperatively and thus avoid these perplexing problems? For the acutely anemic patient, greater safety may lie in immediate control of the hemorrhage rather than delay for further transfusions. This was the case for most of our acutely anemic patients who underwent emergency procedures to control their hemorrhage.

In the chronically anemic patient without renal disease, there are other reasons for not transfusing preoperatively. Aside from the risk of hepatitis, cross sensitization, and other transfusion reactions, there is significant danger of circulatory overload, particularly in the elderly patients.[14] Investigators have reported that such patients may go into high output failure and require a phlebotomy of an amount equal to that transfused![15] In other instances, it has been reported that even though packed red cells instead of whole blood were used for transfusion, there was a decrease in myocardial blood flow, probably because of increased viscosity of the blood.[16] Thus one may well ask which is the greater risk: transfusing preoperatively or proceeding with the anesthetic in the face of the anemia.

For the patient with anemia associated with renal failure, other factors must be considered as well. Many of these procedures are of an emergency nature, hence time is lacking for preoperative transfusion. In addition, since many of these patients return for several procedures, each patient may require multiple transfusions if they are given blood each time. If they are transfused several days in advance of surgery, they usually cannot maintain a normal hemoglobin level because each episode of hemodialysis drops the level once again. In addition, although the risk of hepatitis is small, once incurred it is almost uniformly fatal for these patients. Consequently, one is reluctant to transfuse unnecessarily, if it can be shown that these patients can safely tolerate anesthesia and surgery without it.

Arguments may be marshalled on both sides when one is deciding whether or not to anesthetize an anemic patient without preoperative build-up with iron or transfusion. The time-honored limit of 10 gm of hemoglobin seems to be based more on theory than on clinical or experimental evidence. This limit is predicated on the assumption that because there are times during anesthesia when tissue oxygenation is dangerously critical, especially if the anesthetic technic is flawed, one should therefore transfuse preoperatively to increase the patient's margin of safety. On the other hand, a great deal more clinical and experimental data are needed to establish whether these patients are, in fact, skating on such thin ice. Our experience would indicate that neither morbidity nor mortality are increased by proceeding in the face of the anemia and that it is impossible to be dogmatic about the amount of hemoglobin that is necessary for satisfactory and safe anesthesia. Even with a normal hemoglobin level, some old patients with chronic arterial desaturation or a fixed cardiac output tolerate the stress of anesthesia poorly. On the other hand, young people even with severe anemia may have few physical symptoms and tolerate anesthesia well. Since cardiac failure will occur when the hemoglobin level reaches 2 to 2.5 gm,[4] this may probably be set as the lowest limit at which anesthesia and surgery should be performed except in life-threatening situations. In other instances, the decision must be made on an individual basis.

Summary

From this purely retrospective study of the anesthetic management, course, and postoperative complications of severely anemic patients, we found it is impossible to set limits on the amount of hemoglobin that is necessary for safe anesthesia. We found little evidence in this group of 82 patients with a mean hematocrit of 24.5 per cent to suggest that they differ from normal patients during anesthesia or afterwards. We feel that most anemic patients will tolerate a well-conducted anesthetic and would urge that much more clinical and experimental evidence be accumulated before absolute limits are set on the amount of hemoglobin necessary before anesthesia and surgery are performed. •

GENERIC AND TRADE NAMES OF DRUGS
Halothane—Fluothane
Methoxyflurane—Penthrane

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Tour to the Soviet Union

8-DAYS MEDICAL TOUR TO THE SOVIET UNION visiting Moscow and Leningrad and including a comprehensive medical program has been announced for April 10-18, 1970. The all-inclusive rate is $495 from New York. Travel arrangements are being handled by Compass Travel Bureau, Inc., 55 West 42nd Street, New York, N. Y. 10036, to which all inquiries should be directed. Flights are on Pan American World Airways scheduled direct service to Moscow. Includes Moscow, Leningrad, Kiev, Prague, Budapest.

"COOPERATIVE TUMOR REGISTRY"

Cancer of the Breast in Utah

W. Knox Fitzpatrick‡, Charles R. Smart, MD†, Virginia Moslander§

Mammary cancer represents one of the most absorbing and bewildering problems that faces medicine today. This problem is made exigent by the frequency of occurrence, the high mortality rate, the fatality to women with young families, and the obduracy to cure in spite of a widening spectrum of therapeutic modalities. It is the leading cause of female cancer deaths in Utah as well as in the nation.

THE PRESENT STUDY was undertaken[1] to compare cancer of the breast in Utah with the nation in general. The material was taken from statistics collected by the Intermountain Regional Medical Program Tumor Registry which is a participant in the Rocky Mountain States Cooperative Tumor Registry. The nature of this registry has been previously reported. This study is limited to data obtained from the hospitals in the State of Utah.[2] The present study was carried out by the special study section of the Utah Chapter of the American College of Surgeons under the authorization of the Utah State Cancer Coordinating Committee. Subsequent reports from this and other medical society committees will appear in the future regarding other specific malignancies.

Clinical Material

There were 2,933 cases of cancer of the breast reported to the Registry between 1957 and 1969. Of these cases, 2,308 were "analytic cases." An "analytic case" is one that is counted at the hospital where the original diagnosis was made or from the hospital where the first course of treatment was given. There were 625 non-analytic cases recorded where the diagnosis and original treatment had been made previously in another hospital and subsequent therapy was carried out in a reporting hospital.

The diagnosis was confirmed by histologic examination in 99 per cent of the cases. There were 11 cases diagnosed by clinical and roentgenographic criteria. The diagnosis was established at autopsy in 32 cases. Of the 2,308 cases, 90.9 per cent were followed until death or to the present time; 9.1 per cent (209) cases were not reported in the last two years.

Incidence

Figure 1 shows the relationship of cancer of the breast to the other malignancies in the Utah Tumor Registry. Figure 2 shows the distribution of breast cancer cases by the year of diagnosis. The greatest number of cases, 280, was reported in 1968. There were approximately 500,000 females in Utah in

**A computerized registry system, a confederacy of Colorado, Idaho, Montana, Wyoming and Utah state tumor registries. This is planned as a bi-monthly publication in the RMMJ.

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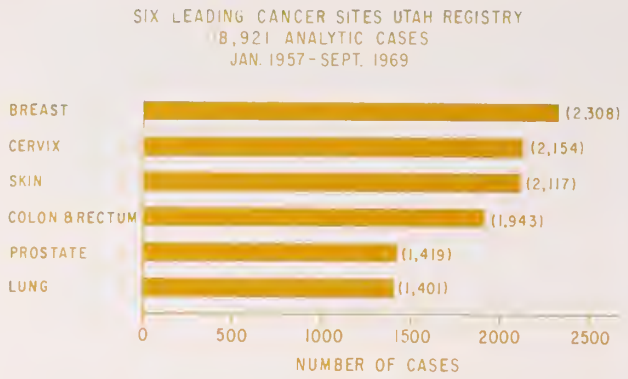


FIGURE 1.

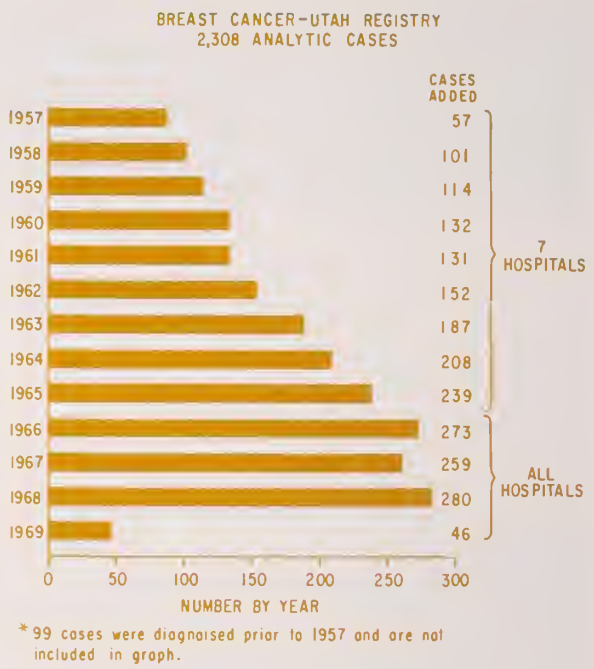


FIGURE 2.

1968, yielding a yearly incidence of about 56.2 per 100,000 females per year. The national incidence is given at about 60 cases per 100,000 per year.[3,4] Three patients in this series were listed as Negro, six others as non-caucasian, and the remainder were caucasian. There were twenty-one cases of breast cancer in males. The age of the patients ranged from 19 to 95 years of age, the mean age being 55 years.

Stage at Diagnosis

Staging was done by the tumor registry secretaries and field workers, based on all information available in the hospital chart i.e., physical examination, operative report, pathology report, x-ray reports, etc. The following definitions were used:

0 In Situ: microscopic, non-invasive carcinoma.

I Localized: detectable in the breast only; no evidence of spread beyond the breast.

II Regional: disease in the breast and the axillary lymph nodes and/or internal mammary, but no evidence of distant spread.

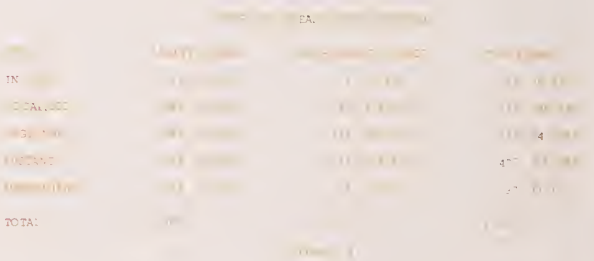
III Distant or Remote: evidence of metastases beyond the axillary nodes.

IV Unknown or Unspecified: this included not only those cases in which a determination of stage was impossible from the evidence in the hospital chart, but also those cases of simple mastectomy where there was no evidence of spread beyond the breast but the axillary nodes were not histologically examined.

Figure 3 shows the stage of disease versus class of case analytic or non-analytic. Forty-five per cent of the tumors were detected while still clinically localized and 8.8 per cent showed evidence of distant metastases at the time of initial diagnosis. When one looks at the total number of cases, which include the non-analytic cases, one frequently is counting the more advanced cases twice (once as an analytic case in the hospital of diagnosis and again as a non-analytic case in the hospital of referral), thus the need to utilize only analytic cases for an analysis of state-wide data.

Age at Diagnosis

Figure 4 shows the stage of the disease at the time the diagnosis was made as compared with the age of the patient. The curves of localized, regional, and distant disease are very similar. This indicates that the age of the patient does not influence the stage of disease; however, there is a definite relationship between the frequency of occurrence of disease and age of patient. Cancer of the breast was seen with the greatest frequency in the sixth decade and only one case was found under the age of 20 years; on the other hand eight cases were seen over the age of 90 years.



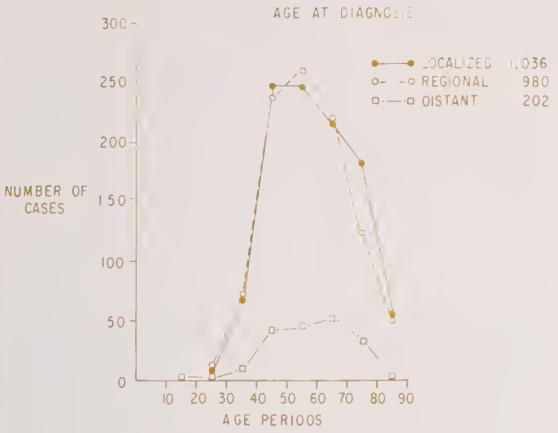
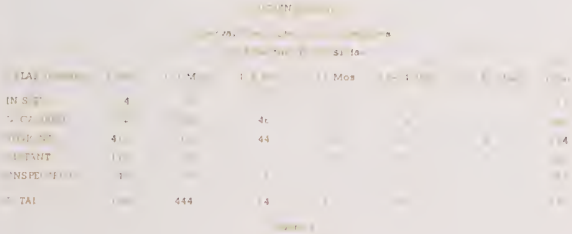


FIGURE 4.

Delay in Treatment

The interval between the first detection of symptoms suggesting cancer of the breast and the initiation of treatment was subdivided into:

a. "Patient Delay": Time between detection of symptoms and reporting to physician. Figure 5 shows that 64 per cent of patients reported symptoms to their doctor within a month. This includes those cases in which the presenting sign was detected by the physician, so these



numbers may be colored in favor of early reporting by the patient. Twenty-five per cent of the patients procrastinated for a period of one to three months, and 11 per cent postponed reporting to their physician for more than three months. In 10 per cent of the cases with less than one month delay, the tumor had already spread to distant sites.

b. "Physicians Delay": Figure 6 shows the time interval between knowledge of the symptoms by the physician and the establishment of the diagnosis. Ninety-two per cent of the diagnoses was made in less than one month and 2.6 per cent was postponed longer than three months.

TREATMENT DELAY

Interval Between Diagnosis and Treatment

DELAY (Months)	1	1-3	3	TOTAL
IN SITU	16			16
LOCALIZED	1,032	6	1	1,039
REGIONAL	975	6	2	983
DISTANT	193	4		197
UNSPECIFIED	63		1	64
TOTAL	2,279	16	4	2,299

Figure 7

c. "Treatment Delay": Figure 7 shows the interval between establishing the diagnosis and institution of treatment. In less than 1 per cent of cases the treatment was postponed more than one month after the diagnosis was made.

Multiple Malignancies

There were 12 per cent (277) of cases with other primary malignancies. The most frequent second primary was in the opposite breast and accounted for 5 per cent of cases (105). Twenty patients had concomitant and 85 had sequential disease. The stage of disease in the second breast at the time of diagnosis showed that 3 were in-situ, 45 were localized, 30 were regional, 2 were distant, and 5 were unknown. The fact that 56 per cent of these cases were in-situ or localized would suggest that these women still had a reasonable chance of being cured if adequately treated. The length of time elapsing between the two primaries varied from one month to 40 years with a mean interval of 6.8 years.

One hundred seventy-two patients had primary cancers in other organs (see Figure 8). The first column indicates the number of cases developing another primary cancer site after having cancer of the breast. The second column shows the number of cancers of the breast developing after a primary cancer in another organ, specified as either the second or third primary neoplasm. Seven patients had three primary cancers as summarized below:

Case I	Skin—Rectum—Breast
Case II	Breast—Skin—Breast
Case III	Skin—Uterus—Breast
Case IV	Skin—Breast—Uterus
Case V	Cervix—Breast—Leukemia
Case VI	Skin—Breast—Multiple Myeloma
Case VII	Breast—Breast—Leukemia

MULTIPLE PRIMARIES

OTHER SITE	FIRST PRIMARY BREAST	BREAST CANCER SECOND OR THIRD	TOTAL
Cervix	4	7	11
Pancreas	3		3
Uterus	4	15	19
Ovary	10	3	13
Lung	1		1
Thyroid	3	3	6
Colon/Rectum	7	10	17
Stomach	1	1	2
Skin	4	16	20
Salivary Gland	1	1	2
Female Genitalia	2	3	5
Leukemia	2	1	3
Hemangiosarcoma	1		1
Reticulum Sarcoma	1		1
Melanoma		3	3
Liver		1	1
Lymphosarcoma		2	2
Multiple Myeloma		2	2
Lip		1	1
Kidney		1	1
Meningioma		1	1
Unspecified	18	39	57
TOTAL	62	110	172
Bilateral Breast Carcinoma			105
Simultaneous Bilateral Breast Carcinoma			20

Figure 8

Skin cancer was more frequently associated with cancer of the breast than any other site exclusive of a second breast primary. Cancer of the cervix, uterus, and ovaries accounted for 15 per cent (43 cases) of all second malignancies.

Treatment

Initial treatment was defined in this study as all treatment given within the first four months of diagnosis and is summarized in Figure 9.

All of the 16 cases of in-situ carcinoma were treated by surgery alone.

Of the 1,040 patients with localized disease, 945 cases (91 per cent) were treated by surgery alone, 4 cases by radiation alone, 40 cases by surgery and radiation, 17 cases by chemotherapy, 18 cases by oophorectomy, and 3 patients with other hormone therapy. The age distribution of the group treated by oophorectomy is similar to the group receiving oophorectomy for regional disease ranging from 22 to 61 years with an average of 42 years of age.

INITIAL TREATMENT
WITHIN FOUR MONTHS OF DIAGNOSIS

	# CASES IN STUDY	SURG	RAD	S&R	ALONE OR COMBINATION WITH S&R: HORMONE	ALONE OR COMBINATION WITH S&R: CHEMO	ALONE OR COMBINATION WITH S&R: H&C	# TREATMENT SPECIFIED
IN SITU	16	16						
LOCALIZED	1040	945	4	40	17	13	4	17
REGIONAL	984	705	16	173	43	31	5	11
DISTANT	204	65	32	17	41	15	10	24
UNSPECIFIED	64	34	1	8	7			14
TOTAL	2308	1765	53	238	108	59	19	66

FIGURE 9

Of the 984 patients with regional disease, 705 cases (72 per cent) were treated by surgery alone and 16 cases (2 per cent) by radiation alone, 173 cases (18 per cent) were treated by surgery and radiation, 36 cases (4 per cent) by chemotherapy,, 38 cases (4 per cent) by oophorectomy, and 10 cases by other hormonal therapy.

Of the 204 patients with distant disease, 65 cases (32 per cent) were treated by surgery alone, 32 cases (16 per cent) radiation alone, 17 cases (8 per cent) by surgery and radiation, 51 cases (25 per cent) by hormone manipulation, and 25 cases (12 per cent) by chemotherapy.

Of the 64 patients with an unknown stage of disease, 34 cases (53 per cent) were treated by surgery alone, 1 case by radiation alone, 8 cases by surgery and radiation, 7 cases by surgery and radiation, and 7 cases with other hormonal manipulations.

Subsequent treatment refers to any cancer-directed therapy given for residual, recurrent or metastatic disease administered at least 4 months after the original treatment. The stage of disease at the time of initial diagnosis is retained as part of the diagnosis despite progression of the disease. The relationship of stage of disease to subsequent treatment simply indicates the point from which the disease was recognized and is not indicative of the extent of disease at the time of subsequent therapy. Of the 2,308 cases in this study, 1,137 cases (49.2 per cent) either received or refused subsequent therapy, and 209 cases (9.1 per cent) were lost to follow-up. Subsequent therapy was given to 41.5 per cent of those initially staged as localized, 54.5 per cent of those initially staged as regional, 66.7 per cent of those initially staged as distant, and 43.8 per cent of those initially staged as unknown. Of the 1,137

SUBSEQUENT TREATMENT

STAGED AT INITIAL DIAGNOSIS	#CASES IN STUDY	# REFUSING SUBSEQUENT TREATMENT	# RECEIVING SUBSEQUENT TREATMENT	SURG	RAD	S&R	ALONE OR IN COMBINATION WITH S&R: HORMONE	CHEMO	H&C
IN SITU	16		6	2	4				
LOCALIZED	1040	99	332	140	68	36	58	16	14
REGIONAL	984	61	475	88	146	50	111	45	35
DISTANT	204	26	110	10	26	5	38	14	7
UNSPECIFIED	64	6	22	7	8	2	5		
TOTAL	2308	*192	**945	247	252	93	212	75	66

FIGURE 10

* 93 OF THIS GROUP ARE CURRENTLY RECORDED AS HAVING NO EVIDENCE OF DISEASE.
** 362 OF THIS GROUP ARE CURRENTLY RECORDED AS HAVING NO EVIDENCE OF DISEASE.

cases needing further therapy, 192 cases (16.9 per cent) refused any further form of treatment, 247 cases (21.7 per cent) received surgery alone, 252 cases (22.7 per cent) received radiation alone, 93 cases (8.2 per cent) received surgery and radiation, 278 cases (24.4 per cent) received ablative endocrine or hormone therapy, and 141 cases (12.4 per cent) received chemotherapy. Both the hormone therapy and the chemotherapy were either given alone or in association with surgery or radiation. Of the 1,137 candidates for subsequent therapy, 455 patients (40 per cent) are presently recorded as having no evidence of disease. (Figure 10).

Results of Treatment

Absolute Life Survival Curves by stage of disease at initial diagnosis have been calculated using the method of Berkson and Gage.[5] It allows the inclusion of all cases even though many have not yet lived 5 years. This method allows a better appreciation of the prognosis of a patient month by month, and year by year, rather than simply at 5- or 10-year intervals. All lost cases are considered dead, and all deaths (whether or not attributable to cancer) are included. No attempt has been made to correct these curves for the naturally expected death rate since the physician needs to know what the absolute chances are of his patient living one to ten years with a given stage of disease. The modes of therapy are many and complex and are applied to a specific patient according to the stage of disease; therefore, no attempt was made to compare surgical with radiation therapy, etc. The absolute five-year survival rate for patients in Utah with localized breast cancer is 71.4 per cent, with regional disease 46.7 per cent, for distant disease is 23.1 per cent, and for those of unknown stage 33.1 per cent. The overall five-year survival rate is 55.4 per cent. (See Figure 11).

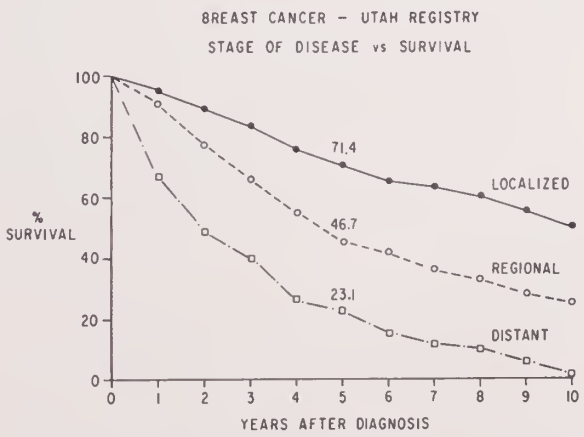
Discussion

While cancer of the breast is the most prevalent cancer in Utah, and is the leading cause of cancer deaths in women, the incidence is about the same as in the country as a whole. The apparent greater prevalence is because of incomplete reporting of skin cancers and the lower rate of occurrence of other cancers. For example, the death from cancer in Utah is 14 per cent[6] as compared with 17 per cent in the nation.[7] The incidence of cancer of the lung is only one-half of the national incidence.[1]

The stage of disease when detected compares favorably with those reported by the End Results Group of the National Cancer Institute vis. 45 per cent versus 46 per cent in localized disease and 42 per cent versus 42 per cent in regional spread.[8]

The age distribution at the time of diagnosis is the same as reported by others with a significant number of patients (26) in their twenties and with a continued morbidity in all decades beyond this point.

While we would like to believe that early diagnosis insures localized disease, this premise has not been supported by these data. If we accept what the patient reports and what the doctor records on the hospital chart, then the group with distant disease had no more delay than those with localized disease. These data, however, in no way lessen the need for eagerness on the part of the patient and the physician to take prompt action. It has been shown that the size of the breast cancer is related to both the presence of axillary metastases and to survival.[9]



*All stages 55.4% - 5yr survival.

FIGURE 11.

The fact that 12 per cent of the patients in this study had second primary tumors, either in the opposite breast or other organs, especially in the female reproductive organs, signifies the importance of directing careful attention to the opposite breast and pelvic organs when following women who have had cancer of the breast. Most follow-up examinations consist of a perfunctory examination for local recurrences and metastatic lesions. To this examination should be added a careful inquiry into the possibility of other primary neoplasms.

The leading mode of therapy in all stages of disease was surgery. Radiation was given as part of primary therapy in 5.1 per cent of localized, 20 per cent of regional, and in 24 per cent of those with distant disease. It was part of subsequent therapy in 46.9 per cent of cases. Carcinoma is reported to occur in the medial quadrant of the breast in about 21 per cent of cases, and of this group, 45 per cent have metastases to the internal mammary nodes.[10] This has led many to the conclusion that medial quadrant lesions should be treated by extirpation or radiation of the internal mammary chain. In our study, only 5.1 per cent of localized tumors had radiation therapy suggesting that the treatment of inner quadrant lesions should be given closer scrutiny. Hormonal therapy was given as part of primary therapy in 5.5 per cent of cases. Prophylactic oophorectomy following supposedly curative surgery in patients with localized or regional disease is not a common practice in our area (56 reported cases), most castration being done therapeutically (121 reported cases). Since the value of prophylactic castration is still controversial,[11] we feel that in most cases oophorectomy should be reserved for the pre-menopausal woman with distant disease. Additive or subtractive hormonal therapy is useful in patients of all ages, and it is therefore interesting to note that only 24.6 per cent of uncured patients in our series received this treatment.

Chemotherapy alone or in combination played little role in primary therapy, being given in only 3.4 per cent of cases. Prophylactic chemotherapy given at the time of supposedly curative surgery has had few advocates in our area, being carried out in only 2.4 per cent of cases. In an early report by Surgical Adjuvant Chemotherapy Breast Group, it appeared that Thio-TEPA was of great value in decreasing recurrences; however, further follow-up showed no difference between the control and treated groups except in pre-menopausal women with positive lymph nodes where there was a few months delay in the development of recurrent disease.[12]

Only 12.4 per cent of uncured patients received chemotherapy. We stressed the value of 5-Fluorouracil, Cytoxan, and Thio-TEPA in the management of advanced breast cancer patients.[13] It should be pointed out that at the beginning of this study chemotherapeutic agents were not commonly available, and the guidelines of hormonal manipulation had not been as accurately drawn as they are at the present time.

In order to appreciate the true meaning of survival in cancer patients, it is desirable to have a base line from which we can judge the effects of curative and palliative treatment. Bloom has summarized the survival rates of untreated breast cancer reported by various authors, totaling 1,165 cases. Of these, 200 or 17 per cent were alive at the end of five years.[14]

The absolute survival rate of patients with carcinoma of the breast in Utah are compared with other large unselected groups in the following table:

PERCENTAGE ABSOLUTE FIVE-YEAR-SURVIVAL RATES

	Utah	Iowa	End Results Group	Cancer Prognosis Manual
Number of Cases	2,308	2,447	18,727	34,695
All Stages	55.4%	53.2%	50%	45.6%
Localized	71.4%	78.6%	72%	
Regional	46.7%	38.3%	42%	
Distant	23.1%	9.2%		

Although there may be some differences in the method of staging, Utah compares favorably with data from Iowa,[15] the End Results Group,[8] and with the accumulative data from the world literature as presented in the Cancer Prognosis Manual.[16] In terms of overall five-year survival rates and for

each extent of disease classification, the figures given are absolute survival rates and do not take into consideration natural attrition due to age. The survival rate of 23.1 per cent for those cases with distant disease would seem to be better than expected, especially when comparing this to Bloom's figure of 17 per cent overall five-year survival of untreated cases which includes some with localized and regional disease.

It is well known that throughout the life of the patient with breast cancer there continues to be a morbidity and mortality from the disease. Five year survival rates are only an early indication of how these patients are surviving. In addition to the problem of continuing morbidity, there is also a 12 per cent risk of developing a second primary. As noted earlier in this paper, the most common second primary was cancer in the opposite breast which occurred at the mean interval of 6.8 years (some occurring as long as 40 years) after the first primary. It is most important that these patients continue to have regular follow-up examinations beyond the five-year period.

Summary

An analysis of 2,308 patients with breast cancer from Utah is made. The need for regular, complete physical examinations is emphasized due to a continuing morbidity from the original disease as well as from additional primary tumors well beyond the five-year period. Patient delay did not correlate with stage of disease. This group of patients compares closely with other similar studies of unselected cases as to incidence, stage of disease at detection, and results of treatment. The use of radiation, hormone therapy, and chemotherapy was less than was expected. ●

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AMA priority objectives:

Solutions to Nation's Major Health Problems

"We plant trees today so that others may have shade tomorrow." Burtis E. Montgomery, MD, Harrisburg, Ill., chairman of the AMA Board of Trustees, recently quoted this Chinese proverb to illustrate that the accomplishments of today's physicians and medical societies should include the solution of eight of the most pressing health problems now confronting the nation. As identified by the American Medical Association, they are:

The acute shortage of health manpower—the demand for health care has created an imbalance in the supply-demand equation of health professionals and other personnel. Increasing affluence, longer life, greater appreciation of good health care, and such government programs as Medicare and Medicaid have greatly increased the demand. Consequently, the AMA, in cooperation with the Association of American Medical Colleges, is urging all medical schools to expand their enrollments and offers its assistance in establishing new schools. Success of this approach to date is evidenced by 24 new medical schools created since World War II, raising to 101 the total of schools now accepting students. Others are in the planning or construction stage, and most existing schools have increased their enrollment.

The AMA Council on Medical Education is cooperating with attempts of medical schools to reduce the length of medical training and its reviewing the time required by various specialty boards for certification of specialists.

The AMA Committee on Education for Related Health Professions and the AMA Council on Health Manpower are also stimulating a variety of programs to develop new physician's assistants, new health care roles for nurses, and innovative steps to increase total productivity. The Association has adopted essentials of accredited educational courses and accredits programs for 13 different technologies. In addition, it endorses increased federal appropriations for both the schools and individual students.

Rising health care costs—the AMA is working closely with the American Hospital Association and hospital medical staffs to review every item of hospital costs in an effort to remove those items which should be supported by other means. Physicians are also being encouraged to eliminate hospital care or reduce it whenever possible and to use less expensive extended care facilities and home health care services. The AMA is now preparing a public education program to illustrate how unrealistic demands for health care inflate costs.

Financing health care—the AMA supports a national health insurance plan based on tax credits and certificates that would enable all Americans to purchase comprehensive health insurance coverage. It's proposal would establish a sliding scale of tax credits depending on the individual's tax liability, and the credits would be applied to health insurance provided by private carriers.

Mental health—the AMA proposed the program that was enacted by Congress to establish a network of nationwide community mental health centers. The program involves close cooperation with the mental health administration and other experts to discover more efficient methods of treatment and rehabilitation, allowing a quicker return to productive work by the patients.

Pollution—the AMA Council on Environmental and Public Health has held several national conferences on the problem of pollution of the air, waterways and the land, and it is working closely with governmental and private agencies to ameliorate this growing health hazard.

Alcoholism and drug addiction — the widespread use of alcohol has been accompanied by millions of medically identifiable alcoholics. They suffer a type of drug addiction which requires medical therapy and which is the cause of 50 per cent of all fatal accidents and innumerable criminal acts. Consequently, the AMA Committee on Alcoholism and Drug Dependence continues to conduct a major educational program in this area, directed at both adults and youths.

Health care of slum residents—the AMA Committee on Health Care of the Poor, recognizing that the problem of health care in the slum is basically a problem of the slum itself, is conducting a series of studies and conferences with civic and social leaders, and it is preparing specific recommendations to improve both the quality and delivery of health care in these areas.

Malnutrition—poor nutrition is more far-reaching than most people suspect. It covers not only the underprivileged, but also the middle-income group and relates strongly to education at all levels of society. The AMA has adopted an aggressive program to fight hunger and malnutrition; local societies are being encouraged to meet with community dietitians, dentists and other health specialists in resource seminars and to participate in area health surveys.

In addition, the AMA will publicize guidelines for the evaluation of malnutrition, examine the science of nutrition as part of formal medical education, seek development of a central coordinating agency for nutrition at a high level in the executive branch of government, urge development of urban and rural programs to provide health services with a nutritional emphasis, and evaluate current nutritional education in schools.

Doctor Montgomery, speaking in behalf of the AMA Board of Trustees, has asked each medical society to help implement these programs at both the state and local level. "Everything physicians do today to help find solutions to these eight major health problems will affect, in large or small part, what physicians of tomorrow will be able to accomplish," he said. •

E. V. Allen Memorial Scholarships

Applications are now being accepted for the E. V. Allen Memorial Scholarships, open to junior and senior medical students attending medical schools in the United States or Canada. The scholarship provides three months of cardiovascular study at the Mayo Clinic, Rochester, as well as $1,000 award.

Deadline for applications is April 1, 1970. Applicants will be notified by May 1, 1970.

Brochures may be obtained by writing to Minnesota Heart Association, 4701 West 77th Street, Edina, Minnesota 55435.

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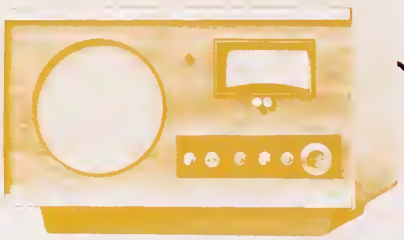

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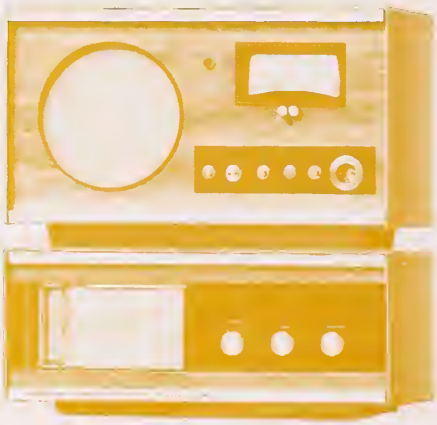

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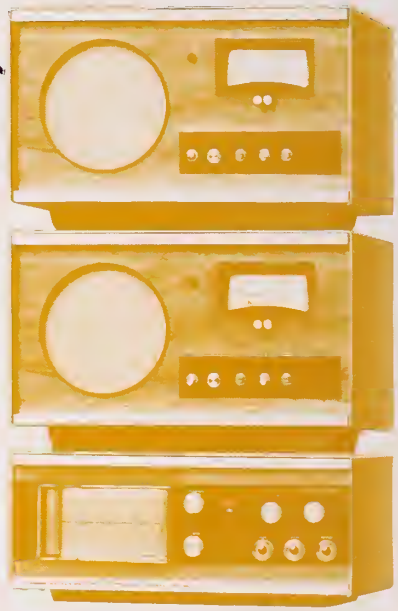

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UTAH

Minutes of the House of Delegates, Utah State Medical Association

Seventy-Fifth Annual Meeting,
Salt Lake City, Utah,
September 10, 1969

First Session—9:00 A.M.

The Seventy-Fifth Annual Meeting of the House of Delegates of the Utah State Medical Association was called to order at 9:25 a.m. in the Little Theater, Salt Palace Complex, Salt Lake City, Utah, by Vice-Speaker of the House of Delegates, William R. Christensen, MD, and the following proceedings were had:

The invocation was offered by Joseph O. Brewerton, MD.

Minutes of the Twelfth Interim Session held March 19, 1969, as contained in the June, 1969 issue of the *Rocky Mountain Medical Journal*, were approved as printed.

Report of the President—Homer E. Smith, MD

I have been honored this past year by serving as President of the Utah State Medical Association. We have had many problems. They have been serious indeed, and most of them have been new and different from any that we have encountered before. I hope that we, as an Executive Committee and the Board of Trustees, have discharged our responsibilities in a mature way which has been a benefit both to the citizens of the state of Utah and to the medical profession, and to the Utah State Medical Association in particular.

There have been two notable areas of problems this past year, the most serious being the professional liability insurance difficulties. As directed by this House of Delegates in March, the Executive Committee of the USMA, with the full support and awareness of your Board of Trustees, has actively continued to seek a solution to the professional liability insurance problem which confronts the physicians and surgeons in the state of Utah.

Though there is a temporary tenebrous amelioration of the precipitous collapse of the professional liability insurance market which occurred last spring, the problem remains as serious as ever. There apparently is no immediate solution in the offing, and, on the basis of current considerations, no long-range prospects for a solution either. We, as you do, recognize that the concern is national in scope, and we are but sharing in our part of the action.

The following courses of action, though not necessarily listed in their sequential relationships, have been taken in our efforts to solve the dilemma:

1. *Publicity*—A great deal of good was accomplished from our previous publicity campaign. However, we must not overlook its potential value in the future when the need for it will occur again. This is with particular regard to the next item.

2. *Legislation*—We are continuing in our efforts to obtain all available data pertaining to legislation in the field of professional liability. This appears to offer the only reasonable and stable solution to the problem in the future.

3. *Incident Analysis Plan*—Through the efforts of Mr. Marty B. Cox and Mr. John H. Snow an INCIDENT ANALYSIS PLAN has been developed. Though still very new in its conceptual relationship to this field of professional liability insurance, it has already generated national interest even with but the barest of its details having been made public.

4. *Home Office Contacts*—Through an emissarial relationship with Mr. Marty B. Cox, we have contacted most of the major insurance companies in the country who write professional liability insurance. These contacts have been made at the home offices.

5. *Proposed Group Plans*—We have evaluated two group insurance plans which respectively required a 75 percent physician participation in one case and a 90 percent enrollment in the other. (The carrier offering the latter plan withdrew its offer August 29, 1969, due to the unavailability of reinsurance.) Our questionnaire, dated August 8, 1969, brought a physician response that was 2 to 1 favoring involvement in such a program consideration.

6. *AMA Resolution*—A resolution was presented by our delegates to the AMA House of Delegates during their meeting in July of 1969.

The AMA House of Delegates adopted a resolution recommending that the AMA not undertake to establish a nationwide professional liability insurance program. The AMA has called on constituent members to push for enactment of "appropriate state legislation designed to provide a more efficient and equitable determination of malpractice claims and litigation."

7. *State Bar Liaison*—An effective liaison has been established with the Utah State Bar and a joint conference of our two professions has been scheduled for this fall. The presentations will cover the legal aspects of the malpractice problems in addition to other subjects of common concern. The meeting will be held in Ogden, Utah, November 13 and 14. *All physicians will be welcome to attend.*

8. *Medical/Legal Council*—A new Medical/Legal Council has been established under the most capable leadership of Chester B. Powell, MD. Important subcommittees have been formed in the Council to more effectively provide an ongoing means to help solve the problems at hand.

9. *Questionnaires*—The two questionnaires have revealed interesting data heretofore unavailable.

10. *Hospital Meeting*—We have met with the Administrator of the L.D.S. Church Hospital System and his insurance advisors to determine whether or not help could be obtained in this direction. The results obtained in Questionnaire Number 2 obviated, for the time being, further efforts in this regard.

There have been meaningful accomplishments, if modest, in some areas as a result of our efforts to date.

1. We have been able to identify, though we are aware that the figure is incomplete, fifteen doctors who do not at the present time have professional liability insurance. Recently there were 174 members of our Association without this coverage.

2. There are fewer policy cancellations at this time. Renewal premiums in some instances, however, have increased to an alarming degree. Some specific examples of these are listed herewith:

	1968 Previous Premium	*1969 New Premium*
a) Ophthalmologist	$ 341.00	$ 1,992.00
b) Ophthalmologist	341.00	1,992.00
c) Orthopedic Surgeon	600.00	2,210.00
d) General Surgery	294.17	3,910.00
e) General Surgery	430.00	2,150.00
f) Anesthesia Group	4,557.00	12,005.00
g) Group of Doctors	7,668.44	19,087.00

This is the bellwether of what we may well expect in the future.

3. We fully well know, and the public must be informed, that the escalation to higher and higher premiums is no answer at all. This is indeed a social problem which the medical profession is powerless to solve alone.

4. To the extent permissible by the home offices, the insurance companies have been most helpful and cooperative. One company, in particular, has taken on a disproportionate number of classes three, four, and five doctors for coverage. It would be in our best interest to increase their classes one and two covered physicians as well. In general, our problems are not entirely with the insurance companies but also with the legal process, the social climate, and the attitude of the public.

5. We have had an absence of an adequate, appropriate, and responsible involvement by the Commission of Insurance for the state of Utah.

To the public, both on a local and national level, grave actual and potential dangers present themselves because of the ever-increasing malpractice suit problems and the attendant results therefrom.

1. "Nationally recognized, highly-qualified specialists are now finding it necessary to recommend that patients with high risk problems seek their care elsewhere. This unfortunate action on the part of the physician is necessary in order to avoid being involved in the nuisance-type malpractice action that too often follows physician participation in these high-risk cases," according to a Los Angeles, California specialist, Howard P. House, MD.

2. There is developing a gradual selective limitation in services rendered by the medical profession that is the direct result of the professional liability insurance problem under discussion.

(a) Emergency room services.
Some recent insurance policies prohibit the doctor from participating in hospital emergency room service activity. On the local scene one of our major hospitals in the state may be required to drastically change its present smoothly functioning emergency room coverage because of this fact.

(b) It is already apparent that there is some limitation of professional services due to the pressure for a conservative approach to problems with increased risk.

(c) The inclination of doctors to accept emergency work mostly for their old patients.

(d) The physician's need to be more selective in accepting new patients or certain types of patients and cases.

(We are all well aware of what occasioned the need for the Good Samaritan Law.)

3. A few of the obvious serious implications resulting from the current difficulty in obtaining professional liability insurance for surgeons, obstetricians, anesthesiologists, and radiologists are herewith listed.

(a) Unless a new doctor has obtained insurance elsewhere prior to locating in the state of Utah to practice, he can, for the most part, obtain insurance only under the following set of circumstances:

I. Affiliating with partnerships, groups, institutions, or clinics,

II. Limit practice to medical or pediatric services only,

III. Governmental employment,

IV. Public Health activities.

(b) Gradual reduction of new doctors coming into the state to enter solo practice. Those who more easily acquire insurance through groups obtain their qualifying status by associations along the Wasatch Front.

4. Rural Health, which is a universal growing source of concern for government, citizens, physicians and the USMA, is going to disproportionately feel the effect of these problems. The activities of the various committees searching for a solution to the delivery of health services in rural areas may find their efforts moot unless there is a corresponding breakthrough in the insurance problem.

Summary

Neither answers nor solutions have been forthcoming from our efforts. With the present climate, the insurance industry seems to have settled into a position of status quo.

Recommendations:

1. Legislation of lasting and meaningful value needs to be promptly forthcoming.

2. A whole new concept of insurance involvement is indicated for study.

3. That we do not involve our USMA in a self-insurance program on a state-wide basis.

4. Thought be given to investigating a regional-type program with the Rocky Mountain Medical Conference.

5. Governmental agencies (third party relationships) carry liability insurance for Title XIX patients.

6. That charity services and public service activities, in which there is a doctor-patient relationship, be obligated to carry their own liability protection for medical or surgical services rendered.

(a) screening program
(b) school athletic activities
(c) organizational relationships

7. The complacent, lofty-pinnacled, rugged individualism which we maintain, is in need of correction. We must *collectively* lend our efforts to effect an ultimate solution to the problem.

Report of the Secretary—Alan E. Lindsay, MD

A new approach is being tried this year for the annual scientific program. It has long been felt by the Scientific Program Committee that two days are sufficient for the scientific program. General sessions have been scheduled in the morning, with double specialty sessions each afternoon. This will give the physicians a rather broad choice of the particular information presented which they can attend.

We have been very fortunate in obtaining eminent out-of-state speakers, but have been even more gratified at the response of the members of the Utah State Medical Association in submitting abstracts of their own papers for presentation. The individual members of the Program Committee should be thanked heartily for the diligent work they have done in preparing for this meeting.

Report of the Treasurer—Ralph C. Richards, MD

Comprehensive report pertaining to the financial matters of the Association.

Report of the Executive Secretary—Mr. Hoyt W. Brewster

We have, within the last few days, received a communication from Mr. Ward C. Holbrook, the Executive Director of the Department of Social Services for the State of Utah, which was very heart warming. We were requested not to make the communication public. I think, however, it would not be violating a confidence if I refer to one statement in the letter which provides considerable encouragement for the Medical Association. This is: "I believe it essential that we conform to the desires of the medical profession in that we do acknowledge the usual and customary fee concept and that payments thereunder be made subject to the directive of the Secretary of Health, Education and Welfare and within the limit of funds available." The request not to make public the entire contents of this letter was contingent upon approval of its proposals from the Board of the Division of Family Services. We were not fortunate enough to receive this approval, but we did receive, under date of September 9th, a letter from Mr. David L. Duncan, their Board Chairman. I would like to call particular attention to two paragraphs:

"The Board is aware of the expressed desire of many doctors to adopt the usual and customary fee concept in payment for physicians' services provided to welfare recipients."

This, of course, is not a completely accurate statement because it isn't a case of many doctors desiring the usual and customary fee concept, but is in fact the official position of the USMA Board of Trustees. A prior letter directed by President Homer E. Smith to Under-Secretary John G. Veneman of the Department of Health, Education and Welfare, had indicated that the official USMA position was in support of the usual and customary fee concept. This, now, is the part that perhaps lends some encouragement:

"The Board would be pleased to review this concept in all its implications with representatives of the Association at the earliest possible date. The Division is presently preparing its legislative budget request for fiscal 1970-71 and would also like to review the Association representatives' budget recommendations for medical services for the new fiscal year. Effective July 1, 1969, the Division of Family Services has coded and will account separately all payments for physicians' services from other medical services rendered under Title XIX. We believe that this change will permit a more complete analysis of and budgeting for physicians' services to welfare patients."

This was another request made in Dr. Smith's letter to Mr. Veneman, namely that the doctors of Utah want to have physicians' fees separated from the total health bill expenditures of the Department of Social Services. Usually the general public is led to believe that the X

millions of dollars paid by that Department for health care is for physicians' fees. Another thing that I discussed with Mr. Holbrook was that when physicians accept reduced fees from the State for services rendered, an accounting should be made in dollars of what these services amount to, and that the physicians be credited for having contributed to the State budget X number of dollars. Because this matter came in after our program was printed, it was assigned as a special order of business to Reference Committee C. Any who have a special interest in this are invited to attend Reference Committee C under the chairmanship of Dr. Carl Woolsey.

May I just say one additional word in behalf of the scientific meetings which will commence tomorrow. Dr. Lindsay has been very modest in not wanting to supplement his printed report, but he and his committee have been very effective in arranging for a program that is truly impressive and which I am sure will be enjoyed by all who attend these scientific sessions. In addition, the facilities of this convention complex provide an opportunity for exhibitor advantages which I am sure each of you will find a pleasant experience as you visit the booths.

In conclusion, I should like to pay tribute to your President with whom it has been my opportunity to work this year and express to him my admiration for his expertise and his dedication and his diligence. As Speaker Christensen has indicated, there is no way to measure the emotional strain and the physical contribution that have gone into the efforts of President Smith during his administration. And to his Executive Committee, which has been at his right hand, and the Board of Trustees, my admiration is almost beyond expression. I have witnessed the service of these men whom you selected to be your leaders during the past year and have marveled at their dedication. I consider it an honor and a privilege to serve you and to act in any capacity which will be beneficial to this Association. I thank you for your confidence.

Report of the AMA Delegate—Drew M. Petersen, MD

The 118th Annual Convention of the American Medical Association was held in New York City July 13 through 17, 1969. Out of 244 Delegates, 243 were in attendance. This is a record that has gone on for years and years, and I cannot help but call it to your attention. I think it speaks very highly of the dedication that our fellow colleagues have.

One of the important actions that took place was the change in the scientific section. It is now to be allowed that the scientific sections will have what they call a section council and on this council will be representatives of various specialty groups who will then in turn direct the affairs of the various sections. The various specialties will then have a voice in the affairs of the American Medical Association. This was one of the past criticisms that they were not represented, and I think that this is certainly a step in the right direction.

One of the very important items I think that all physicians should be aware of is the Peer Review. The House adopted the Council on Medical Service's report, and the Council stated that it knows of no greater challenge facing the medical profession today than to secure universal acceptance and application of the Peer Review. This simply means that doctors are to review one another. The review concept is the most meaningful method for creating public awareness of Medicine's awareness to insure high quality of health services at a reasonable cost.

There was a resolution passed on private practice in which it was stated that the American Medical Association establish a Council on Private Practice with the primary objective being to espouse the aspirations and goals of private practice. This was referred to an Ad Hoc Committee to be appointed by the Speaker of the House to further study and elaborate on.

There has been a change in the policy of the American Medical Association concerning federal support of medical schools. A joint report of the Board and the Council on Education was approved which calls for an increase in financial support of medical schools by the federal government to permit a major increase in the enrollment of medical students in the production of physicians. The change was considered justified because of the current fiscal conditions which make it increasingly difficult for students to obtain loans from the private sector.

The Board of Trustees established a Committee on Health Care of the Poor, and this is an extremely difficult problem. They just had a two-day meeting in which a number of high-caliber people from in and out of government were invited to deal with this particular subject. It does appear that the AMA is taking a step in the right direction.

Inasmuch as we have a resolution before this body regarding sex education, I think it would be well to read the entire report of AMA Reference Committee G on this subject. I believe that after hearing it, you delegates will be a little better informed and can then discuss more adequately the resolution which is before us. This report follows:

"Currently as indicated by Resolutions 63, 96, and 120, and the testimony given at the Reference Committee hearing on this issue, there is much discussion and debate with respect to sex education in schools. Each of the three resolutions is directed toward the affirmation of an AMA position in this area which will provide helpful guidelines for communities concerned with this problem. It has always been the policy of the American Medical Association on this and other health issues to emphasize local responsibility in meeting specific needs. At the hearings on this issue there was apparent agreement on the need at this time for a clear-cut statement of the AMA's position in this area. There was general agreement that the right kind of sex education in schools is desirable but that such instruction must be properly defined and oriented. By sex education it is meant instruction to strengthen family life, to increase self understanding and self respect, to develop capacity for human relationships, to build sexual and social responsibility and to enhance competency for responsible parenthood. It is not concerned with sexual techniques or sexual deviations. As a result of the committee's deliberations, including review of many documents in this area and analysis of the testimony, it appeared that Resolution 96, incorporating certain principles drawn from the other resolutions and the testimony would provide the kind of physician statement this House of Delegates could support. Therefore, the Reference Committee recommends the adoption of the following substitute resolution in lieu of the other three resolutions:

WHEREAS, the traditional sources of sex information and guidance for young people are often inadequate; and

WHEREAS, the local public and parochial schools—as social institutions accessible to all young people, reflecting broad community support and with sufficient intellectual and material resources—can aid substantially in the development of sound individual codes of sexual behavior; therefore be it

RESOLVED, that the American Medical Association recognizes that the primary responsibility for family life education is in the home, but that the AMA support in principle the inauguration by State Boards of Education or school districts, whichever is applicable, of a voluntary family life and sex education program at appropriate grade levels:

1. As part of an over-all health education program
2. Presented in a manner commensurate with the maturation level of the students
3. Following a professionally developed curriculum foreviewed by representative parents
4. Including ample and continuing involvement of parents and other concerned members of the community
5. Developed around a system of values defined and delineated by representatives comprising physicians, educators, the clergy, and other appropriate groups
6. Utilizing classroom teachers and other professionals who have an aptitude for working with young people and who have received special training; and be it further

RESOLVED, that local organizations be urged to utilize physicians as consultants, advisors, and resource persons in the development and guidance of such curriculum and that State and County Medical Associations be urged to take an active role in this participation.

Other miscellaneous actions taken by the AMA House are covered in my printed Handbook report and I believe are self explanatory. I would now like to take this opportunity to thank our Executive Secretary, Mr. Hoyt W. Brewster, Dr. John H. Rupper, the President-elect, and Dr. Chester B. Powell for their comments and their courteous suggestions, as well as for their gracious company during the House of Delegates meeting. Thank you.

Report of President to USMA Woman's Auxiliary— Mrs. A. Willis Smith

We, as doctors' wives, have as our objective to assist you as members of the Utah State Medical Association and the medical profession generally in the advancement of medicine and public health. We also hope to cultivate friendly relations and to promote mutual understanding among physicians' wives and families.

Mrs. John M. Chennault, the newly-elected National Auxiliary President, asked us all to work closely with our husbands in the medical societies to raise the level of health care for all people. She said, "Let us always be ready to stand up and be counted as we speak out with pride for those things that are right with medical practice," and this we are striving to do.

Our School of Instruction was held on May 26, 1969. Our State officers and committee chairmen held workshop sessions with all the county officers and county chairmen to help them plan their activities for the coming year. We have an excellent group of women working in the Auxiliary both on the state level and on the County levels.

I don't know whether you doctors ever have time to read Today's Health when it comes to your reception rooms, but we encourage you to take time to read it. In the last issue, September 1969, there is an article dealing with the GEMS Program. GEMS stands for Good Emergency Mothers Substitutes. This is a program sponsored by the Woman's Auxiliary, and has been in effect for about ten years. It consists of a course for junior and senior high school students, 4-H girls, Girl Scouts, MIA girls, and, actually anyone in the age group where they would be babysitting. Our County Auxiliaries in Davis, Weber, Cache, Carbon, and Salt Lake have programs started in their areas to help our young people become better babysitters.

The most important big item in our lives at this very moment is this convention and the activities that are connected with it. Mrs. Donald A. Kirk is the general chairman for the women's activities, and our theme is Med-A-Merica. I know that you will hear much about these activities from your wives.

Mrs. R. C. L. Robertson, our National Auxiliary President-elect, will be in Salt Lake City for the convention. She will speak to us at our general meeting, and also at our luncheon. She is a very charming woman and a hard-working Auxiliary member from Houston, Texas.

Report of the President of Utah Chapter, Student American Medical Association— Mr. Colin K. Kelly

It is indeed a pleasure for me to present to you the annual report of the Utah Chapter, Student American Medical Association.

In March of this year the Utah Chapter of the Student American Medical Association held its annual election and chose myself as president, Dean Duke as the vice-president, and David Lindberg as secretary-treasurer. A representative from each class was also chosen. Dr. Linday Kumagai served as our faculty advisor until last June when he left the Medical School for another assignment. We are in the process of selecting another advisor.

It was reported to this House of Delegates several years ago that, in the past, there had been a traditional antagonism from the administration and some students towards the Student American Medical Association. Complaints were concerned with such things as our supposed involvement with the AMA, our charging a $10 fee for membership, and, perhaps most important, that our organization does not serve the entire student body. Programs were launched at that time to benefit the entire student body and during the past two years programs have been instituted to reach more of the medical students. This is the theme for the balance of my remarks this morning.

Last September when school started, SAMA sponsored a very successful book exchange which offered, among other things, the chance for the upper classmen to blow some of the dust off their basic science texts and exchange them for money from the lower classmen. This afforded them a chance to secure books at a reduced price, and also a chance to visit with these students who are their upper classmen and orient themselves to the medical school curriculum.

Last October the Utah Chapter of SAMA sponsored a symposium entitled, The Physician's Life, and during this symposium Dr. Lincoln Clark, Professor of Psychiatry, spoke on Drug Abuse Among Physicians. Dr. C. H. Hardin Branch, Chairman of the Department of Psychiatry, discussed the subject of Suicide and the Physician, and Dr. Russell M. Nelson talked on the M.D. as a Family Man. Over 150 students and their wives attended and heard these local physicians speak.

January of this past year set the stage for an excellent SAMA student scientific symposium. Some of the subjects that were researched and presented were experience in canine liver transplantation, effects of marijuana on behavior, and canine vaccination against snake bites. The first place winner of $100, a plaque, and a trip to Galveston, Texas to present his paper was Craig Davis, who this year is an intern. His topic was bone transplantation using a tube pedicle flap as a carrier. Dr. Davis was the Utah Chapter SAMA President last year. Dr. Clifford Snyder, Head of the Division of Plastic Surgery at the Medical School, was the special guest speaker at this science symposium, and this event will again be conducted this year.

Shortly after the science symposium the Utah SAMA sponsored a Military Seminar during which time representatives from the three branches of the service discussed their respective programs and answered questions from the medical students, interns, and resident physicians who attended.

Last April our President, Vice-President, and a special observer attended the National SAMA Convention in Chicago. I reported on this convention in the June issue of the *Utah Medical Bulletin*. It should be interesting to you to know that many of your future colleagues in our National House of Delegates reviewed material and formulated resolutions on such subjects as the ABM controversy, the proposed FCC ban on all radio and television tobacco advertising, abortion, medical education, public health service expansion to enable more young physicians to fulfill their national service obligation in this manner, health care delivery, racial equality for medical school admission, the pharmaceutical industry, and also many other topics. The delegates at our convention voted to recognize the Student Osteopathic Medical Association. At this convention Senator Edmund S. Muskie, Democratic Senator from Maine, delivered the keynote address. Other speakers included Wilbur J. Cohen, former Secretary of Health, Education and Welfare; CBS Newscaster Walter Cronkite; Dr. Dwight Wilbur, Past President of the AMA; and Maynard Shapiro, President of the American Association of General Practice. Edward Martin, who is a junior at the University of Kansas Medical School, was elected as the SAMA National President for the coming year. Dean Duke, Alternate Delegate from Utah, was assigned to the Reference Committee on Medical Manpower. So much for the convention, but I cannot leave the subject without extending appreciation to the Utah State Medical Association for your financial help in enabling the Utah delegation to travel to this convention.

This coming October 24th, Utah SAMA is conducting a symposium entitled Medicine and Society. At this time discussions will be presented by medical people, paramedical personnel, and the layman regarding the problems of health care delivery in the Intermountain area. These discussions will run all morning on October 24th from 8:00 a.m. until 1:00 p.m. at the University of Utah Medical Center. You are cordially invited to attend.

Also in October, National SAMA, in conjunction with the American Pharmaceutical Association, will conduct an interprofessional student symposium at the University of Utah College of Medicine entitled, The Health Team of the Future. Specific subjects to be reviewed by both medical and pharmaceutical students include professional education; and the health profession, a paper team.

A word should be said at this time about our Chapter's membership and mechanics. Eighty-four percent of the present senior class are members of the Student American Medical Association. The percentage membership of the second and third year classes is somewhat less than this. However, it is substantial enough to maintain the viability of SAMA for the coming years. We are financed through membership dues and by contributions from

such organizations as drug companies and various departments of the University of Utah College of Medicine, the Utah Academy of General Practice, and the Salt Lake County Medical Society and Utah State Medical Association. At the present time we are the only actively functioning medical-student group at the College of Medicine. Other medical school fraternities are inactive. A few students have some indirect affiliation with SHO, which is the Student Health Organization. A group of 15 to 20 students, some of whom are SAMA members, have combined their abilities and energies recently to develop the Central City Health Clinic, which functions as a screening program.

I have talked in length about SAMA activities, both locally and nationally. I would like to change the direction of my talk in conclusion, however. May I conclude with observations of some of the attitudes of the present medical students, students not only locally but nationally as well. These students are becoming more and more aware of the medical problems in our communities. They want to know about these problems, and also to participate in their solutions. They would like to have such information taught in medical school, but this isn't being done. They believe they can obtain both academic insight and a knowledge of health care delivery problems and do it both at the same time. SAMA, by setting up Ad Hoc committees for the study of these health problems, and in establishing summer health projects, has attempted to fill this vacuum in the medical student's experience, but it isn't enough. Another source of help in teaching the medical students the realities of health care delivery problems, I feel, is that of the local practicing medical professions. Hopefully you can teach us some of the problems and suggest to us how we can be of help. At a recent meeting of the Board of Trustees of your organization it was unanimously agreed that a student representative from SAMA be invited as an observing guest at future Board meetings. We appreciate this liaison. We wish to learn and help as you would like to have us do. Surely one of our common goals is the improvement of health care delivery.

Thank you very much for your support and your concern.

Second Session—2:00 P.M.

The Chairman of the Credentials Committee reported a quorum in attendance, and the Second Session was declared in order.

The Nominating Committee offered the following candidates: President-elect, Russell M. Nelson, MD, and Vincent L. Rees, MD, both of Salt Lake City; Honorary President, Charles R. Cornwall, MD, Salt Lake City; Secretary (three-year term) Allan H. Barker, MD, and John R. Ward, MD, both of Salt Lake City; Treasurer (three-year term), Hal H. Bourne, MD, and Ralph C. Richards, MD, both of Salt Lake City; Delegate to the AMA (two-year term), L. V. Broadbent, MD, Cedar City, and Drew M. Petersen, MD, Ogden; Alternate Delegate to AMA (two-year term), Merrill C. Daines, MD, Logan, and Gene E. Speakman, MD, Mt. Pleasant; Speaker of the House of Delegates (two-year term), William R. Christensen, MD, Salt Lake City, and M. Paul Southwick, MD, Ogden; and Vice Speaker of the House (two-year term), Wm. Knox Fitzpatrick, MD, Salt Lake City, and J. Robert Poulsen, MD, Granger. It was moved, seconded and approved that the report of the Nominating Committee be accepted. Tellers were appointed and delegates were instructed to cast their ballots.

Reference Committee chairmen then made recommendations pertaining to the various reports submitted by officers and committee chairmen of the USMA.

The following four resolutions and a special order of business were also presented to the House of Delegates, and subsequently approved with some minor amendments:

SEX EDUCATION IN THE SCHOOLS

WHEREAS, In view of the moral duty which we as adults bear to the younger generation to pass on knowledge painfully gained through the millenia of human history; therefore be it

RESOLVED, That the Utah State Medical Association go on record as favoring the development of appropriate curricula of sex education in the schools of Utah "around a system of values defined and delineated by physicians, educators, clergy, parents, and other appropriate groups"; and be it further

RESOLVED, That members of this Society be urged to cooperate in the formulation and implementation of such programs.

TITLE XIX MEDICAID DUAL FEE SCHEDULE

WHEREAS, The physicians of Davis County believe a dual fee schedule for like services performed by general practitioners and specialists implies a dual standard of medical practice; and

WHEREAS, Such dual fee schedule is contrary to medical ethics and principles; and

WHEREAS, It is our contention that the differential in fees paid to specialists should be in accordance with the specialized procedures they perform and services they provide; therefore be it

RESOLVED, That the Davis County Medical Society hereby declares opposition to the arbitrary and unilaterally discriminatory fee schedule as published by the Utah State Department of Social Services, Division of Family Services, and urges the House of Delegates to direct the officers of the Utah State Medical Association to review the fee schedule and make recommendations to correct the discrepancies mentioned and adopt an acceptable schedule which pays usual and customary fees for services provided regardless of type of practice.

DUES ADJUSTMENT FOR UNIVERSITY PERSONNEL

WHEREAS, It is highly desirable that full-time members of the faculty of the University of Utah College of Medicine become full members of the Utah State Medical Association and take an active role in its programs; and

WHEREAS, The payment of dues constitutes a considerable financial burden on the younger men in the lower echelon ranks of academic medicine because of their relatively low salary; therefore be it

RESOLVED, That the Utah State Medical Association dues for full-time Fellows, Instructors, and Research Instructors of the University of Utah College of Medicine be established at 25 percent of the usual dues, and for Assistant Professors and Assistant Research Professors at 50 percent of the usual dues, provided that they otherwise qualify for membership in the Utah State Medical Association.

PROPOSED CONSOLIDATION OF DEPARTMENTS OF HEALTH, SALT LAKE CITY AND SALT LAKE COUNTY

WHEREAS, For nearly thirty years citizens of Salt Lake County, through their elected representatives, have studied and planned for the merger and consolidation of the Departments of Health of the cities of Salt Lake County and Salt Lake County; and

WHEREAS, Consolidation has finally been accomplished pursuant to agreement signed by the governing bodies of both cities and County; and

WHEREAS, It is apparent that the consolidated health district presently has no authority to levy the necessary tax to provide revenue to finance the consolidated Department of Health and that such authority must be granted by the Legislature of the State of Utah; therefore be it

RESOLVED, By the Utah State Medical Association that the Legislature of the State of Utah, in its 1970 Session, should enact such legislation as will provide authority for the necessary taxation to finance the operation of the consolidated health districts in the state of Utah.

OFFICIAL USMA POLICY REGARDING MEDICAID PAYMENTS

It is evident that a new concept of the delivery of health care services for Title XIX must come into being in the state of Utah for the program to succeed:

1. That any agreed upon plan used to determine the fees paid for services rendered under Title XIX be based on the current usual, customary, and reasonable schedule as it pertains to the practice of medicine and surgery here in the state of Utah.
2. That the appropriate committee and also the Board of Trustees of the Utah State Medical Association be consulted for approval of any fee schedule before it is published.
3. That adequate, accurate publicity be given annually to the news media detailing the amount in dollars that the medical profession has donated to the charity cause by accepting as payments in full the reduced percentage of the usual, customary, and reasonable fee.
4. That accurate annual dollar representation of the amount paid solely to the physicians and surgeons be stipulated, rather than the "lump sum of medical services designation" usually supplied to the news media.
5. That the government, both Federal and State, commence a study to implement malpractice insurance coverage for Title XIX recipients. The evaporation of malpractice insurance availability from the scene with ever-increasing frequency makes this a necessary concern of both the State and Federal governments.
6. That it be realized that the medical profession in the State of Utah no longer finds it acceptable for the State, by virtue of eminent domain, to give away the time and services of a physician in relationship to that part which is discounted from the welfare payments for their services. In view of the fact that the current concept is for both the providers and consumers of health services in this country to be adequately and forcefully represented in any given area of endeavor, the physicians of the State of Utah now insist that this same prerogative be extended to them in the "giving away of their time and services."

Members of the House of Delegates were then informed of the results of the elections, which are as follows:

President-elect: Russell M. Nelson, MD; Honorary President: Charles R. Cornwall, MD; Secretary: Allan H. Barker, MD; Treasurer: Ralph C. Richards, MD (re-elected); Delegate to AMA: Drew M. Petersen, MD; Alternate Delegate to AMA: Merrill C. Daines, MD; Speaker of the House of Delegates: William R. Christensen, MD; Alternate Speaker of the House: Wm. Knox Fitzpatrick, MD.

President Homer E. Smith then reported that the following members of the Utah State Medical Association had passed away since the last session of the House of Delegates held on March 19, 1969:

Frank H. Cutler, Jr., MD, Salt Lake City, Utah; Robert D. Preston, MD, Salt Lake City, Utah; Delbert R. Hales, MD, American Fork, Utah; Blaine R. Brown, MD, Salt Lake City, Utah.

A moment of silence was accordingly observed.

President Smith then presented his remarks, as retiring President, to members of the House of Delegates, stating that he would support Dr. John H. Rupper, incoming President, in every way possible. He then turned the gavel of the Presidency over to Dr. Rupper. President Rupper's message follows:

It is an honor and a pleasure to accept the Presidency of the Utah State Medical Association. This marks the beginning of the fifth year of a close association with the leadership of the Society, and I must say that I am highly impressed with their ability and willingness to work for the well-being of the public. I have enjoyed an education at the hands of some excellent teachers, namely Drs. Verl Broadbent, Paul Clayton, Drew Petersen, Homer Smith, and their associated trustees. On reviewing the work of all the committees during the past few months, I am pleased with their efforts. They have been most diligent and capable. I must note some of the highlights and accomplishments of Dr. Homer Smith, the trustees, and the committees because some of the objectives sought are still to be completed in the future. The problem of professional liability insurance consumed much effort during the past year. The problem has been well outlined and directions of approach have been developed. Many avenues are now to be explored in a methodical manner by the Medical/Legal Council recently formed. I feel, however, that the majority of physicians of the state are insufficiently affected by the problem in order to cause them to make a radical change in their insurance programs. I gather this opinion from the results of a recent questionnaire requesting whether or not each individual would be willing to change his present insurance carrier and whether they would be willing to change their automobile and private property insurance carriers. However, I can understand their reluctance for change because we cannot be assured that these changes will not place some of us in a more precarious position. Much work remains to be done both in altering situations external to us, educating ourselves and others and developing a greater appreciation of the seriousness of the problem so that we can all unite together in its solution.

The re-writing of the Constitution of the Utah State Medical Association is in progress and has an energetic committee behind it. Dr. Smith developed some new councils, and has reorganized all of the councils and their chairmen. He has, in his report to you, made an observation that the council chairmen with their individual committee chairmen should be able to generate considerable interest and new ideas and objectives for each of their committees. He has asked that the council chairmen and their committee chairmen meet at least every two months to see what activities and in which areas of concern they feel their committees should involve themselves. This is an excellent recommendation which I think will result in considerable benefit. The matter of Rural Health Care is being pursued by many committees, namely, the Rural Health Committee, the Research Foundation Advisory Committee, the Ad Hoc Committee for the Delivery of Health Care in Rural Areas, Special Comprehensive Health Planning Committee, Medical Advisory Committee to the University of Utah College of Medicine, and also the State of Utah, the Governor, legislators, and the people living in these rural areas. This comprises nine different bodies. I am sure that with all this interest and some good coordination of effort that something should be accomplished.

The Woman's Auxiliary is a real live action group. Although they seem to need little help, I feel the councilors of each component society should meet with the county auxiliaries two or three times a year, if not to give help, then to receive advice to carry back to the trustees.

The new *Council on Trauma, Emergency and Disaster Services* is to be commended for their great activity and should be supported by all of us in their efforts.

The Medical Education and Hospital Relations Committee report should be studied carefully by your trustees and then careful, thoughtful action taken. This is primarily concerned with continuing education of the physicians in this state.

I now wish to praise some of the actions taken by Dr. Homer Smith and the trustees this past year. We have saved the Association considerable money by dispensing with the services of the advertising agency which we formerly kept on a contingency fee and other fees for individual services. Our own capable office staff has performed all of this work during the past year and has done a better job for far less expenditure of our funds. Another money-saving, or better stated, money-earning device was instituted by our excellent treasurer, Dr. Ralph Richards. He has been buying high-interest-bearing treasury bills which mature at varying times, becoming available for current operating expenses as needed instead of this money lying dormant in checking accounts or at lower interest in savings accounts.

At this point, I wish to indicate that every effort will be made to implement your many recommendations which have resulted from this Delegates' meeting.

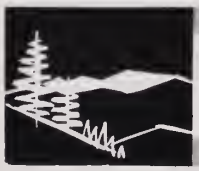
It is to be noted that Dr. Wallace Brooke's appraisal of Blue Shield problems is that of an expert and should be read and appreciated by all. I feel that every member of the Utah State Medical Association should be alert to the recommendations he has made, and I plan to have his report published in the *Utah Medical Bulletin* for all to read. Incidentally, there are other reports in the Delegates' handbook which should be read by every member of the State Association, and will therefore also be published in the *Utah Medical Bulletin*.

Another objective which must be pursued is the development of an efficient method of legislator education on a continuing month-to-month basis regarding our recommendations which affect the people of the State of Utah. I feel that physicians would be more effective in counseling the legislators and others in public life if physicians were more evident in every-day public affairs. Therefore, I recommend that each and every one of you become more active in your church, business clubs, Chambers of Commerce, PTA's, and all civic functions. I realize that all of you are busy, but, on the other hand, when one is well known other than as being a physician, his counsel will carry far more weight in public affairs, not only for our own personal benefit, but also for the benefit of the public at large in public health matters.

Another area of effort lies in instituting methods of bringing the many specialty groups into closer contact with the State Association. This can be done through providing a common office with a secretary in the Utah State Medical Association office who can perform much of the specialty group's work for them. This will help them to do a better job for their own groups and result in savings to them because of the added available facilities of the State Association. This, then, will also result in a greater correlation of our common interests. Another area of service to specialty groups will be to seek recommendations from these groups as to their desires for committee appointments to such sensitive committees as the Fee Schedule Committee and other representation of their individual needs in the State organization.

With these observations, I wish to thank the entire membership for the confidence they have placed in me and for the excellent supporting staff of officers they have provided to work with me. Thank you.

There being no further business, the Seventy-Fifth Annual Meeting of the House of Delegates of the Utah State Medical Association was adjourned at 5:00 p.m., September 10, 1969.



COLORADO

Richard E. Moss, Colorado Industrial Commission secretary, announces that the new medical fee schedule for workmen's compensation which will go into effect January 1, 1970, is now available.

Copies can be obtained from the Colorado Division of Labor, 200 East 9th Avenue, Denver 80203, at a cost of $1 per copy. The state Workmen's Compensation Act requires the commission to set a maximum medical fee schedule, and next year's rates were set after several meetings with representatives from medical organizations and workmen's compensation insurance carriers earlier this year.

MEDICAL SCHOOL NOTES

University of Colorado Medical Center

Dr. Henry M. Lewis, Denver dermatologist and associate clinical professor of dermatology on the volunteer faculty of the University of Colorado School of Medicine, has been elected to a three-year term, expiring in 1973, on the 17-member Medical Board of the University Hospitals. Doctor Lewis fills a vacancy to be created by expiration next month of the term of Dr. Edward G. Billings, Denver psychiatrist and retiring president of the staffs.

At their annual meeting, members of the staffs also voted to enlarge the board by inclusion of the incumbent president of the University of Colorado Medical Center House Staff Association. Current president of the association, which represents the interns and resident physicians at the Medical Center, is Dr. Barry S. Mayer, a second-year resident in radiology.

* * * * *

Dr. William G. Hemenway, professor and head of the Division of Otolaryngology of the University of Colorado School of Medicine, and Mrs. Marion P. Downs, chief audiologist, have left Denver for Saigon where they will assist in the opening of a new otolaryngology clinic in a teaching hospital of the University of Saigon Medical School.

The two were instrumental in organizing the clinic during previous visits to the South Vietnamese city as part of the United States' effort to aid that nation's medical education through a program administered by the American Medical Association under a contract with the U. S. Agency for International Development.

Several medical schools have been involved in the project, which sends American medical faculty members and technicians to Saigon as consultants and brings South Vietnamese physicians to the U. S. to study American teaching techniques.

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MEETINGS

University of Colorado School of Medicine, Postgraduate Medical Education
16th Annual General Practice Review

Humphreys Postgraduate Center, Denver, Colorado

January 18-24, 1970

Sunday, Jan. 18—Metabolic Potpourri
Monday, Jan. 19—Medicine
Tuesday, Jan. 20—Pediatrics
Wednesday, Jan. 21—Dermatology
Thursday, Jan. 22—Surgery
Friday, Jan. 23—Obstetrics, Gynecology
Saturday, Jan. 24—Fluid and Electrolyte Balance

Fees: $90.00 for the full course or $20.00 per day.

For more detailed information contact The Office of Postgraduate Medical Education, University of Colorado School of Medicine, 4200 East Ninth Ave., Denver, Colo. 80220.

Western Colorado Spring Clinics
Grand Junction, Colorado

April 17-18, 1970

The program will consist of lectures and discussion groups by the faculty members of the University of Utah School of Medicine.

The National Conference on Diseases of the Breast

Brown Palace Hotel, Denver, Colorado

May 13-16, 1970

For further information, please contact Wendell P. Stampfli, MD, Department of Radiology, Saint Luke's Hospital, 601 East 19th Ave., Denver, Colorado 80203.

1970 Symposium—Southeastern Chapter of the Colorado Academy of General Practice

Minnequa University Club, Pueblo, Colorado

Recent Advances in Cardiovascular Disease

April 26, 1970

For futher information concerning this meeting contact: Samuel Nelson, MD, 212 Colorado Building, Pueblo, Colo.

44th Congress—International Anesthesia Research Society

Caesar's Palace, Las Vegas, Nevada

March 15-19, 1970

12th Annual Western Cancer Seminar

Frontier Hotel, Las Vegas, Nevada

May 4-5, 1970

Topics to include Leukemia and Lymphomas; Head and Neck Chemotherapy; Use of Chemotherapeutic Agents; Mammography and Thermography; Terminal patient management, etc. Fee: $25.00.

University of New Mexico School of Medicine, Postgraduate Seminar

Albuquerque, New Mexico

Gynecologic Endocrinology and New Diagnostic Method of OB-GYN

February 6-7, 1970

University of Utah College of Medicine, Division of Postgraduate Medical Education

11th Annual Obstetrics and Gynecology Course

C'est Bon Convention Center, Park City, Utah

February 12-14, 1970

Fee: $65.00. Credit (AAGP) 14 hours

Open to all physicians

University of Utah College of Medicine, Division of Postgraduate Medical Education

15th Annual Anesthesiology Course

C'est Bon Convention Center, Park City, Utah

February 21-24, 1970

Fee: $85.00. Credit (AAGP) 23 hours

Open to all physicians

Montana Medical Association
23rd Interim Meeting

Holiday Motel, Helena, Montana

April 3-4, 1970

American Medical Association
23rd National Conference on Rural Health

Pfister Hotel & Tower, Milwaukee, Wisconsin

April 9-10, 1970

7th Congress of the International Diabetes Federation

Buenos Aires, Argentina

August 23-28, 1970

For preliminary program, write Postal Address: Dr. V. G. Foglia, VII Congreso, Federacion Internacional Diabetes, Paraguay 2155. 7º piso, Buenos Aires, Argentina. Phone: 83-8419.

OBITUARIES

Montana

John Joseph Malee, MD, Anaconda, died in a Seattle hospital on November 21, 1969. Doctor Malee was born July 19, 1898, in Anaconda, Montana. He received his B.S. degree from Creighton University in 1922 and his MD degree from Creighton University School of Medicine in 1924. Doctor Malee was a captain in the medical corps of the U. S. Army during World War II and was awarded a meritorious service citation and other decorations. Doctor Malee was a past president of the Montana Medical Association and served as a member of several of the important committees. He was also a member of the American Medical Association and of the International College of Surgeons. He was also very active in fraternal and community affairs in Anaconda.

* * * * *

Morris Alan Gold, MD, Butte, died in Portland on November 19. Doctor Gold was born in Milwaukee, Wisconsin, on September 30, 1908. He received his M.A. degree from the University of Wisconsin in 1932 and his MD degree from Marquette University School of Medicine in 1935. Doctor Gold served his internship and residency at St. James Hospital in Butte and, upon completion, undertook the practice of internal medicine in that community. During World War II, Doctor Gold served as a flight surgeon in the U. S. Air Force. He was particularly active in community affairs and was a member of the Board of Directors of the Butte Chamber of Commerce from 1961 until 1963. He was a past president of the Montana Medical Association and served as a member or as chairman of a number of important committees. Doctor Gold was a Fellow of the American College of Physicians and a member of the American Heart Association, the American Trudeau Society and many other special societies.

* * * * *

James Ingersoll Wernham, MD, Billings, died on November 2 at St. John's Retirement Home. Doctor Wernham was born November 25, 1874, in Marengo, Illinois. He received his B.S. degree from the University of Illinois in 1899 and his MD degree from Rush Medical College in 1902. After engaging in the practice of medicine in Marengo, Illinois, in association with his father for several years, Doctor Wernham was licensed in Montana and established his practice in Billings during 1912. He served as a member of many important committees of the Montana Medical Association and as president during the 1940-41 term. Doctor Wernham served as chief of staff at St. Vincent's Hospital, Billings, on several occasions. He was particularly active in civic and community affairs and was a member of the City Council in Billings for 12 years. He was a member of the Fifty-Year Club of the Montana Medical Association and of the American Legion.

Colorado

Robert M. Maul, MD, 50, died unexpectedly of a heart attack November 9, 1969, in Las Vegas, Nevada. He was returning from a trip to visit his daughter in college in San Luis Obispo when stricken.

Born in Fort Sheridan, Illinois, Doctor Maul was educated in Denver public schools, the University of Colorado at Boulder, and the University of Colorado School of Medicine, receiving AB and MD degrees, the latter in December, 1943. He married the former Helen Holroyd on June 7, 1942, in Denver.

Bob Maul is well remembered by his peers as an honorable, dependable, unselfish, true man—both as a medical student and fellow MD. For the last few years of his life, after his first heart attack, he devoted himself unstintingly to one of the most trying of practices—nursing home geriatrics. One has only to follow in his paths to realize the patient acclaim he had.

He was a member of the Washington Park Methodist Church, Phi Rho Sigma medical fraternity, the various Masonic bodies, Delta Tau Delta, Alpha Epsilon Delta, and Optimist International.

He was very active in the Colorado Academy of General Practice and served as its president in 1957-58; secretary and delegate to the American Academy of General Practice and delegate to the Colorado Medical Society, 1950-57. He was a member of the American Medical Association, American Academy of General Practice, Colorado Academy of General Practice, Colorado Medical Society and Denver Medical Society.

Doctor Maul is survived by three sons and one daughter: Dr. R. Edwin, a dentist; Richard J.; Roger W., and Miss Leann Maul; and two brothers, Herman S. of Denver and Eugene M. of Kingsport, Tennessee, both physicians.

Memorial contributions may be made to the Heart Foundation or the Shrine Crippled Children's Fund.

THE BOOK CORNER

Recent Acquisitions

Acute Abdomen, v.10: By Thomas W. Botsford and Richard E. Wilson. Philadelphia, 1969, Saunders. 179 p. Price: $9.00.

Advanced Gastrointestinal Cancer; Clinical Management and Chemotherapy: By Charles G. Moertel and Richard J. Reitemeier. New York, 1969, Hoeber. 218 p. Price: $13.50.

Anatomy; A Regional Study of Human Structure: By Ernest Dean Gardner, Philadelphia, 1969, Saunders. 812 p. Price: $19.00.

Bacterial Episodes and Plasmids: By Ciba Foundation. Boston, 1969, Little, Brown. 268 p. Price: $12.50.

Cardiac Arrest and Resuscitation: By Hugh E. Stephenson, Jr. St. Louis, 1969, Mosby. 659 p. Price: $29.50.

Circulatory and Respiratory Mass Transport: By Ciba Foundation. Boston, 1969, Little, Brown. 310 p. Price: $12.50.

Current Concepts in Ophthalmology: By Bernard Becker and Ronald M. Burde. St. Louis, 1969, Mosby. 267 p. Price: $21.00.

Diagnosis and Management of Pain Syndromes: By Bernard E. Finneson. 2d ed. Philadelphia, 1969, Saunders. 337 p. Price: $12.50.

The Divided Self, an Existential Study in the Sanity and Madness: By R. D. Laing. London, 1960, Tavistock. 237 p. Price: $6.50.

Experience in Hepatic Transplantation: By Thomas E. Starzl. Philadelphia, 1969, Saunders. 553 p. Price: $37.50.

Involuntary Movement Disorders: By Irving Spencer Cooper. New York, 1969, Hoeber. 410 p. Price: $29.50.

Major's Physical Diagnosis: Edited by Mahlon H. Delp and Robert T. Manning. 7th ed. Philadelphia, 1969, Saunders. 356 p. Price: $10.30.

The Politics of Experience: By R. D. Laing. New York, 1967, Pantheon Books, 138 p. Price: $4.95.

Practical Urology: By Chester C. Winter. St. Louis, 1969, Mosby. 249 p. Price: $11.00.

Progress in Clinical Pathology, v.2: Edited by M. Stefanini. New York, 1969, Grune & Stratton, 385 p. Price: $19.50.

Recent Advances in Clinical Pathology, Series 5: Edited by S. C. Dyke. Boston, 1968, Little, Brown. 528 p. Price: $19.50.

Social Psychiatry, v.47: By Association for Research in Nervous and Mental Disease. Baltimore, 1969, Williams & Wilkins. 354 p. Price: $21.00.

Surgery of the Chest: By John H. Gibbon, Jr. 3rd ed. Philadelphia, 1969, Saunders. 954 p. Price: $32.50.

Textbook of Dermatology: Edited by Arthur Rook and others. Philadelphia, 1968, Davis. 2 vols. Price: $69.00.

Transurethral Prostatectomy; Techniques, Hazards and Pitfalls: By George O. Baumrucker. Baltimore, 1968, Williams & Wilkins. 141 p. Price: $9.50.

Trauma to the Thorax and Abdomen: Edited by J. D. Martin, Jr. and others. Springfield, Ill., 1969. Thomas. 566 p. Price: Review.

Book Reviews

Excellent New Anti-Chiropractic Book Recommended by the AMA

"At Your Own Risk: The Case Aganist Chiropractic" is the title of the book, authored by Ralph Lee Smith, published September 11 by Trident Press. It is of particular value to the medical profession in that the debunking of chiropractic as a "science" is a factual, fully documented presentation of the history, philosophy and present-day practices of a profession that has confused the public by its false aura of science and its achievement of state licensure.

The author, an accomplished lay writer highly respected for his objectivity, reveals chilling facts: that a number of practicing chiropractors received their degrees by mail order; that apart from their chiropractic training, many chiropractors have only a high school education, and that no medical degree (MD) is necessary or even recommended as a prerequisite to engage in the practice of chiropractic.

The chairman of the AMA Committee on Quackery, Joseph A. Sabatier, Jr., MD, in his review of the book, said: "This volume should be read by every physician. Also, any person who has an interest or commitment in the health care afforded his fellow man will be better equipped by virtue of the exposure of this unscientific cult as a significant health hazard. The book should be required reading for every person in the education field concerned with career counseling. All trainees in the health care field including every technical and professional branch and level of instruction should profit by study of the volume."

He adds that this book provides documented evidence upon which the scientific community, the general public—and most important of all—legislative bodies can reach a proper conclusion. In quoting the author, Doctor Sabatier wrote in his review: "Whatever the difficulties involved, state legislatures can no longer ignore their public obligation to face the issues and the facts, to acknowledge their error, and to set things straight. First of all, legislation in scientific fields that pays no attention to science is bad law, and shows a deep failure on the part of legislators to fulfill their responsibility to their constituents. Second, in this country at this time, anyone claiming to have a valid treatment for human illness should be required to show its validity before the bar of science before receiving a state license to use it on the sick. Third, the correct way to deal with treatment methods that cannot or will not submit to the judgment of scientific research is not to limit and oversee them, but to prohibit them. By abandoning all these precepts in the face of political pressures created by chiropractors, state legislatures have created a state-supported medical superstition."

Smith proposes two steps that he says must be taken by the legislature in the 48 states that license chiropractors:

"The first step, and one that must be taken immediately, is to prohibit further use of x-ray by chiropractors . . . and the next step is for each state to create an orderly program for withdrawing chiropractic licenses."

Doctor Sabatier advised that any scientifically oriented person who reads this book and who does not recognize his own obligation in exposing to the public the dangers of this specific health hazard would do well to re-examine his motives. To help the medical profession accelerate and implement

its efforts to further its program of anti-chiropractic education, the AMA Department of Investigation has purchased a considerable quantity of "At Your Own Risk" and offers them at a discount price to medical societies and to individual physicians. In August, the Department sent 100 paperback versions and one hard-cover book to each state medical society, and one paperback to each county medical society.

In a letter to each society, H. Doyl Taylor, director of the department, announced that although the hard-covers are priced at $4.95, the special reduced cost for 11 or more is only $2.50 each. Similarly, the individual price for the paperbacks is 95 cents, but the AMA is making a special offer of 50 cents each for orders of 11 or more. The books, in both hard-cover and paperback, are available from the AMA Order Department, 535 North Dearborn Street, Chicago, Illinois 60610.

Mr. Taylor recommends a wide distribution of this book throughout both the profession and the community because "we believe this independently written, privately published book will be another major tool that can be used in medicine's continuing attempts to inform the public, in general, and the legislators, in particular, about the evils of chiropractic."

Prepared by Norman H. Budde
Program Services Department
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

Homicidal Threats: By John M. Macdonald, MD, Springfield, Illinois, 1968, Charles C. Thomas. 123 p. Price: $6.50.

Homicide, or homicidal threats are problems that have been with man since the beginning of time. No other single act of violence tends to produce more anxiety and perhaps irrational behavior than homicide or its threats. Strangely enough, very little scientific work has been directed toward the uncovering of the meanings of these situations, the origin of such behavior, or attempts to evaluate their seriousness. This is precisely what has been done in this book by Dr. John Macdonald, who is Associate Professor of Psychiatry and Director of Forensic Psychiatry at the University of Colorado School of Medicine.

This is a short (120 pages) book that concisely outlines the problems of the homicidal threats and discusses not only those who kill or threaten to kill but those who are threatened, and the role that they play in the possible resulting homicide. The book describes with clarity the assessment of the potential predicators of murder and describes methods of emergency evaluation of people who make homicidal threats. In addition, there is an extremely valuable discussion of the medicolegal aspects of the homicidal threats and the various difficulties encountered not only by the physician but by the police departments in handling these threats.

The book also contains a most interesting chapter written by Margaret Mead, Ph.D., concerning the cultural factors in the cause and prevention of homicide. There is also an interesting discussion of the various psychiatric technics available for the treatment of persons who make homicidal threats, along with a rational discussion of the limitations of the various forms of treatment now available.

This interesting book discusses in detail the factors that are frequently seen in people who commit murder or make serious threats, and aids greatly in developing technics of history which will uncover such factors. The book further dispels common fallacies concerning the subjects, and in general is most helpful to the physician or other interested parties in formulating approaches to such problems.

The book, *Homicidal Threats,* in no way pretends to answer all of the questions but serves to provide useful information to anyone involved with this type of person and also provides helpful guidelines in establishing future research to further clarify the subject.

I would like to recommend this book highly not only to psychiatrists and physicians but to laymen as well who have interest or contact with the problems of homicide or its threats.

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Publication rules and suggestions to authors

1. Who may submit articles. The Rocky Mountain Medical Journal ordinarily accepts only articles prepared by members of the state societies we serve and by guest speakers at their official meetings.

2. Method of preparation. All material for publication must be typewritten, double spaced, with liberal margins, using only one side of the paper, pages consecutively numbered, and preferably on standard 8½ x 11 white bond paper. Carbon copies are *not* acceptable.

Title (preferably short) and author's name, city and state must appear at the top of the first page. Second and subsequent pages should be identified with consecutive page numbers and author's surname. If physician authors possess more than one degree, the MD only is used. Lesser degrees of non-MD authors or co-authors may be used.

Please include beneath the title or at the top of the first page a brief paragraph stating what the article is designed to show and, therefore, why it should be read. This introductory feature is, in editorial parlance, called the "blurb"; it is printed in bold type.

3. Where to submit material. All copy must be sent to the editor for the state in which the material originates. Editors for each state, with their mailing addresses, are listed monthly on the Table of Contents page of the Journal.

4. Acceptance or rejection. The state editor will (1) tentatively accept the article, (2) return it to the author with suggestions for revision, or (3) reject it. He will edit and forward approved copy to the publication office in Denver for final editing and scheduling.

5. Order of publication. Ordinarily, articles will be published in the order received. Those whose value is seasonal, whose value would be lost if publication is delayed, or which reflect priority of original research, are given special consideration. State presidential addresses, programs, state society minutes, and timely organization announcements are given priority.

6. Length of articles. Scientific papers should be "boiled down" not to exceed ten pages of double-spaced typewritten standard 8½ x 11 inch sheets. Shorter papers are more acceptable to editors and readers, and earlier publication is probable. Every journal is in competition for the reader's time, and condensation is the order of the day. For this reason, and because of financial and space limitations, we request that copy be condensed to the greatest extent consistent with conveying the message.

7. Illustrations. A limited number of illustrations or "cuts," usually up to six, will ordinarily be accepted within our own publication budget if the editor believes they enhance the value of the article. Clear photos, simple diagrams or line drawings in black on white, printing rather than writing, reproduce well. Cuts should be mounted separately, and the paper or cardboard mounts should be the same size as that upon which the article is typed. Each should have its caption below: Fig. 1, Fig. 2, etc., with a short descriptive sentence. Authors will be billed our cost for excess above six cuts.

8. Tables. Tables should be simple, presenting only brief relevant data, amply spaced. They should be placed at the back of the manuscript on separate sheets. Each should have its number and title above: Table 1, Title; Table 2, Title; etc. Long, large, or complicated tables ordinarily are not acceptable.

9. Case reports. Case reports are popular with our readers. A brief introductory statement concerning the condition or disease, tells why the case is presented. The report follows with a separate heading, CASE REPORT or CASE 1, CASE 2, etc. Include only relevant, positive laboratory and other data. Names, initials, and numbers are unimportant; age, sex, and sometimes occupation are significant. Minimize dates; then make it month, date, year—as February 9, 1969; not 2/9/69. After the case presentation, review or sum it up under a heading such as Discussion, Comment, Summary or Conclusion.

10. Footnotes. Footnotes must be brief. One at the bottom of the first page should state the Society and date of presentation, and institutional origin, if any. Special titles or position of the author, acknowledgements, etc., will be added according to simplicity, editorial policy and discretion.

11. References. Reference lists rarely add to the value of an article for the majority of readers. We will make every effort to publish short reference lists, but long ones will be deleted. Incidentally, the proper heading is "References," not "Bibliography." The latter implies everything in the literature upon the subject. Make them uniform in style and brief, as: Jones, W. K.: Pyelonephritis in Infancy. JAMA 141:75. 1964.

12. Editorials. We would like to have more submitted by our State editors and the membership at large. Readers must get tired of thunder from publication headquarters in Denver; frankly, we do too! Speak out, and we'll sign your name, initials, or respect your request for anonymity, as you choose. If you don't like something we do or say, please let us in on it; we could even stand to hear about it if something happens to please you. A "Letter to the Editor" may help you get something off your mind. We're asking for it and we have a place to put it—in the Journal, that is!

13. Proofs. Galley proofs are submitted to the author, and prompt return is essential. Authors should correct typographical, grammatical, or rhetorical errors, but do not reinsert or rewrite sentences, paragraphs, tables, etc., which an editor may have deleted, condensed, or paraphrased. When an article reaches the galley-proof stage, the author may NOT re-edit his article; that is the privilege of the Journal's editors.

14. Reprints. Most authors desire reprints. Our printing firm provides them on a non-profit basis. They MUST be ordered when the author submits his corrected proof.

15. Our Journal is copyrighted. We and most state and regional journals owned by state medical societies have granted each other continuing copyright permission to copy or quote with proper credit. Copyright permission is not granted to commercial or privately owned publications.

Rocky Mountain Medical Journal

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February 1970

VOLUME 67 • NUMBER 2

COLORADO • MONTANA • NEVADA • NEW MEXICO • UTAH • WYOMING

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The girth control pill

Tepanil® Ten-tab®

(continuous release form)

(diethylpropion hydrochloride)

works on the appetite not on the 'nerves'

When girth gets out of control, TEPANIL can provide sound support for the weight control program you recommend. TEPANIL reduces the appetite—patients enjoy food but eat less. Weight loss is significant—gradual—yet there is a relatively low incidence of CNS stimulation.

Contraindications: Concurrently with MAO inhibitors, in patients hypersensitive to this drug; in emotionally unstable patients susceptible to drug abuse.

Warning: Although generally safer than the amphetamines, use with great caution in patients with severe hypertension or severe cardiovascular disease. Do not use during first trimester of pregnancy unless potential benefits outweigh potential risks.

Adverse Reactions: Rarely severe enough to require discontinuation of therapy, unpleasant symptoms with diethylpropion hydrochloride have been reported to occur in relatively low incidence. As is characteristic of sympathomimetic agents, it may and jitteriness. In contrast, CNS depression has been reported. In a few epileptic an increase in convulsive episodes has been reported. Sympathomimetic cardiovascular effects reported include ones such as tachycardia, precordial pain arrhythmia, palpitation, and increased blood pressure. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride; this was an isolated experience, which has not been reported by others. *Allergic phenamena* reported include such conditions as rash urticaria, ecchymosis, and erythema. *Gastraintestinal effects* such as diarrhea constipation, nausea, vomiting, and abdominal discomfort have been reported. Specific reports on the hematopoietic system include two each of bone marrow depression, agranulocytosis, and leukopenia. A variety of miscellaneous adverse reactions have been reported by physicians. These include complaints such as dry mouth, headache, dyspnea, menstrual upset, hair loss, muscle pain, decreased libido, dysuria, and polyuria.

Convenience of two dosage forms: TEPANIL Ten-tab tablets: One 75 mg. tablet daily, swallowed whole, in midmorning (10 a.m.); TEPANIL: One 25 mg. tablet three times daily, one hour before meals. If desired, an additional tablet may be given in midevening to overcome night hunger. Use in children under 12 years of age is not recommended.

T-006A / 1/70 / U.S. PATENT NO. 3,001,9

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Lutrexin®

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3000 UNIT TABLETS

IN THE TREATMENT OF FUNCTIONAL DYSMENORRHEA AND SELECTED CASES OF PREMATURE LABOR AND 2ND AND 3RD TRIMESTER THREATENED ABORTION

- LUTREXIN, the non-steroid "uterine relaxing factor" has been found to be useful by many clinicians in controlling abnormal uterine activity.
- Literature on indications and dosage available on request.
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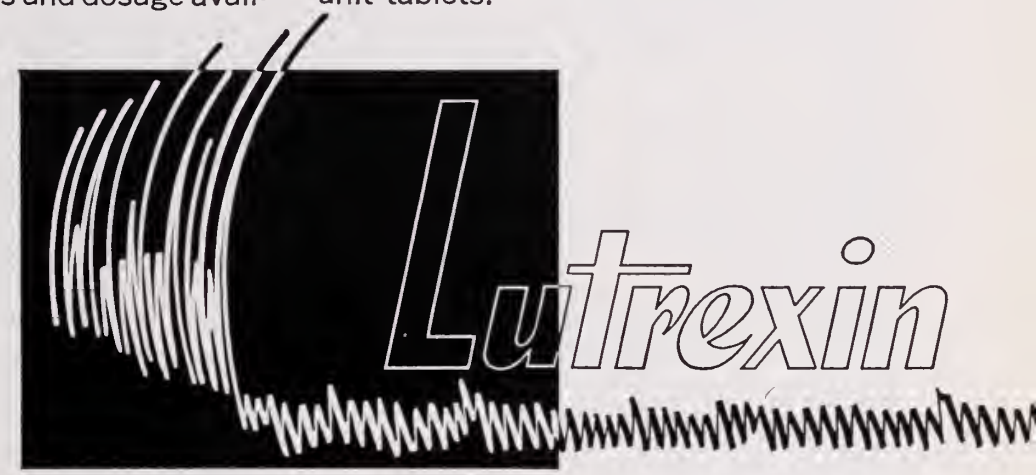

(In vivo measurement of Lutrexin on contracting uterine muscle of the guinea pig.)

HYNSON, WESTCOTT & DUNNING, INC. BALTIMORE, MARYLAND 21201

(LTR23)

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OUR COVER PHOTO

February in Jackson, Wyoming, finds the World Champion Cutter races in full swing. The season extends from mid-January to the end of February. Photo courtesy of Wyoming Travel Commission.

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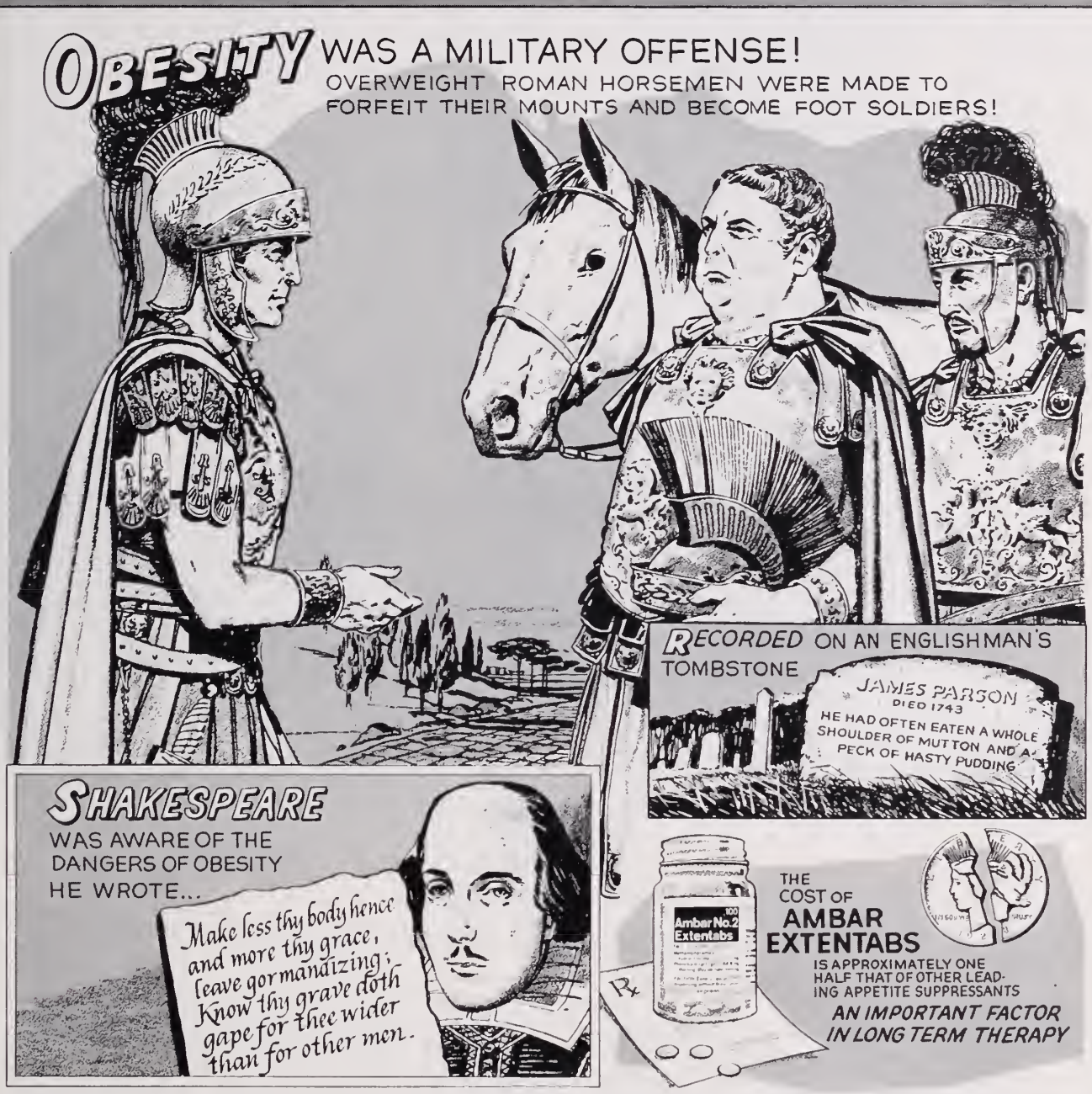
The AMBAR® SCRAPBOOK of

Obesity Oddities

FACT & LEGEND


OBESITY WAS A MILITARY OFFENSE!
OVERWEIGHT ROMAN HORSEMEN WERE MADE TO FORFEIT THEIR MOUNTS AND BECOME FOOT SOLDIERS!
RECORDED ON AN ENGLISHMAN'S TOMBSTONE
JAMES PARSON
DIED 1743
HE HAD OFTEN EATEN A WHOLE SHOULDER OF MUTTON AND A PECK OF HASTY PUDDING
SHAKESPEARE
WAS AWARE OF THE DANGERS OF OBESITY
HE WROTE...
Make less thy body hence and more thy grace, leave gormandizing; know thy grave doth gape for thee wider than for other men.
Ambar No.2 Extentabs
THE COST OF
AMBAR EXTENTABS
IS APPROXIMATELY ONE HALF THAT OF OTHER LEADING APPETITE SUPPRESSANTS
AN IMPORTANT FACTOR IN LONG TERM THERAPY

CONTROL FOOD AND MOOD ALL DAY LONG WITH A SINGLE MORNING DOSE

AMBAR #2 EXTENTABS®

methamphetamine HCl 15 mg., phenobarbital 64.8 mg. (1 gr.) (Warning: may be habit forming).

One Ambar Extentab before breakfast can help control most patients' appetite for up to 12 hours. Methamphetamine, the appetite suppressant, gently elevates mood and helps overcome dieting frustrations. Phenobarbital, the sedative in Ambar, controls irritability and anxiety...helps maintain a state of mental calm and equanimity. Both work together to ease the tensions that erode the willpower during periods of dieting.

Also available: Ambar #1 Extentabs®—methamphetamine hydrochloride 10 mg., phenobarbital 64.8 mg. (1 gr.) (Warning: may be habit forming).

BRIEF SUMMARY/**Indications:** Ambar suppresses appetite and helps offset emotional reactions to dieting. **Contraindications:** Hypersensitivity to barbiturates or sympathomimetics; patients with advanced renal or hepatic disease. **Precautions:** Administer with caution in the presence of cardiovascular disease or hypertension. **Side Effects:** Nervousness or excitement occasionally noted, but usually infrequent at recommended dosages. Slight drowsiness has been reported rarely. See package insert for further details.

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symptoms of mixed anxiety-depression are rarely clear-cut...
but they are often a clear indication for

Mellaril®
(thioridazine)
25 mg. t.i.d.

effective in mixed anxiety-depression and in moderate to severe anxiety

Before prescribing or administering, see Sandoz literature for full product information, including adverse reactions reported with phenothiazines. The following is a brief precautionary statement.

Contraindications: Severe central nervous system depression, comatose states from any cause, hypertensive or hypotensive heart disease of extreme degree.

Warnings: Administer cautiously to patients who have previously exhibited a hypersensitivity reaction (e.g., blood dyscrasias, jaundice) to phenothiazines. Phenothiazines are capable of potentiating central nervous system depressants (e.g., anesthetics, opiates, alcohol, etc.) as well as atropine and phosphorus insecticides. During pregnancy, administer only when necessary.

Precautions: There have been infrequent reports of leukopenia and/or agranulocytosis and convulsive seizures. In epileptic patients, anticonvulsant medication should also be maintained. Pigmentary retinopathy may be avoided by remaining within the recommended limits of dosage. Administer cautiously to patients participating in activities requiring complete mental alertness (e.g., driving). Orthostatic hypotension is more common in females than in males. Do not use epinephrine in treating drug-induced hypotension. Daily doses in excess of 300 mg. should be used only in severe neuropsychiatric conditions.

Adverse Reactions: *Central Nervous System*—Drowsiness, especially with large doses, early in treatment; infrequently, pseudoparkinsonism and other extrapyramidal symptoms; nocturnal confusion, hyperactivity, lethargy, psychotic reactions, restlessness, and headache. *Autonomic Nervous System*—Dryness of mouth, blurred vision, constipation, nausea, vomiting, diarrhea, nasal stuffiness, and pallor. *Endocrine System*—Galactorrhea, breast engorgement, amenorrhea, inhibition of ejaculation, and peripheral edema. *Skin*—Dermatitis and skin eruptions of the urticarial type, photosensitivity. *Cardiovascular System*—Changes in the terminal portion of the electrocardiogram have been observed in some patients receiving the phenothiazine tranquilizers, including Mellaril (thioridazine). While there is no evidence at present that these changes are in any way precursors of any significant disturbance of cardiac rhythm, several sudden and unexpected deaths apparently due to cardiac arrest have occurred in patients previously showing electrocardiographic changes. The use of periodic electrocardiograms has been proposed but would appear to be of questionable value as a predictive device. *Other*—A single case described as parotid swelling.

SANDOZ PHARMACEUTICALS, HANOVER, N.J.

SANDOZ 69-384

Picture of low back pain

treated with Parafon Forte® TABLETS

Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility... stop pain-spasm feedback

by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

Contraindications: Sensitivity to either component. ***Precautions:*** Exercise caution in patients with known allergies or history of drug allergies. If a sensitivity reaction or signs or symptoms suggestive of liver dysfunction are observed, the drug should be stopped. ***Adverse Reactions:*** Occasionally, drowsiness, dizziness, lightheadedness, malaise, overstimulation or gastrointestinal disturbances may be noted; rarely, allergic-type skin rashes, petechiae, ecchymoses, angioneurotic edema or anaphylactic reactions. In rare instances, *Paraflex* (chlorzoxazone) may possibly have been associated with gastrointestinal bleeding. While *Paraflex* (chlorzoxazone) and chlorzoxazone-containing products have been suspected as being the cause of hepatic toxicity in approximately eighteen patients, it was not possible to state that the dysfunction was or was not drug induced. ***Usual Adult Dosage:*** Two tablets q.i.d. ***Supplied:*** Scored, light green tablets, imprinted "McNEIL"—bottles of 100.

References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

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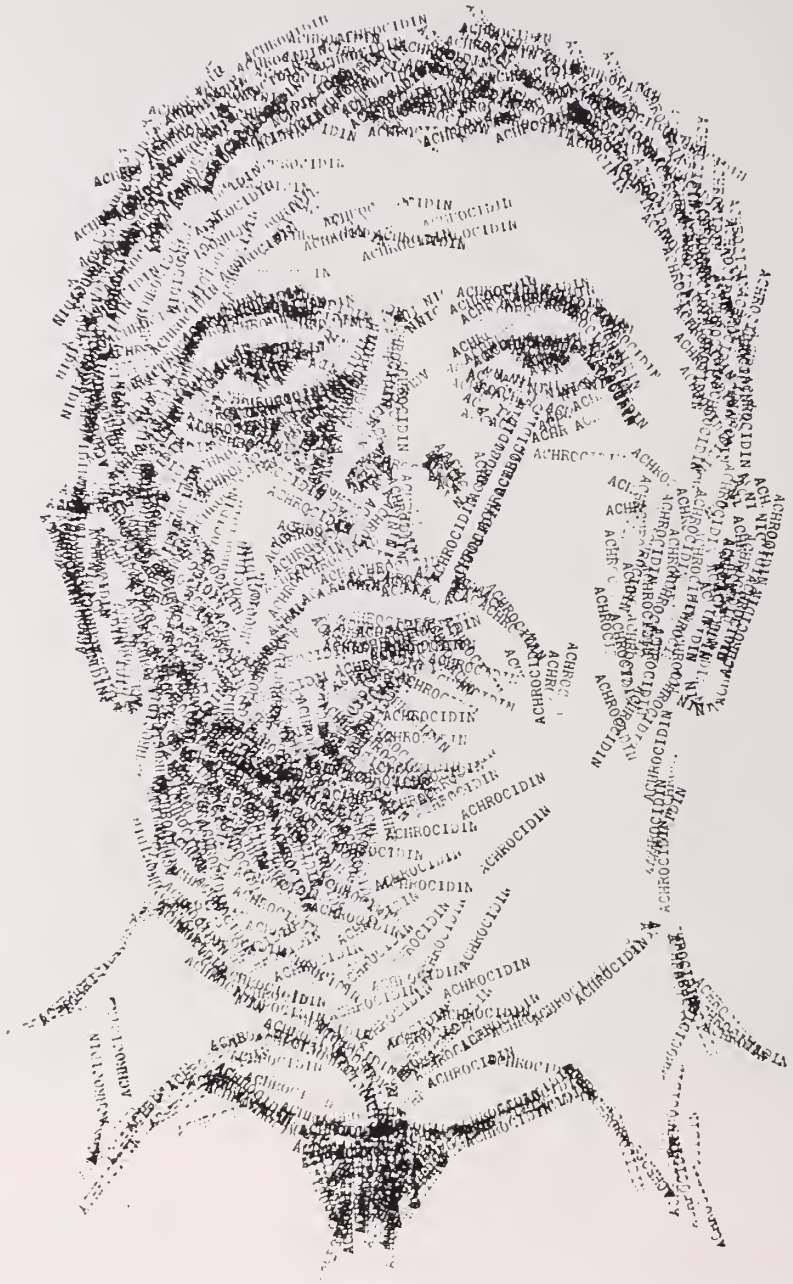
*U.S. PATENT NO. 2,835,677



Achrocidin® Tablets and Syrup

Tetracycline HCl—Antihistamine—Analgesic Compound

Each tablet contains: ACHROMYCIN® Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Caffeine 30 mg.; Salicylamide 150 mg.; Chlorothen Citrate 25 mg.

ACHROCIDIN Tetracycline HCl—Antihistamine—Analgesic Compound Tablets and Syrup are recommended for the treatment of tetracycline-sensitive bacterial infection which may complicate vasomotor rhinitis, sinusitis and other allergic diseases of the upper respiratory tract, and for the concomitant symptomatic relief of headache and nasal congestion. For children and elderly patients you may prefer caffeine-free ACHROCIDIN Syrup. Each 5 cc contains: ACHROMYCIN Tetracycline equivalent to Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Salicylamide 150 mg.; Ascorbic Acid (C) 25 mg.; Pyrilamine Maleate 15 mg.

Contraindications: Hypersensitivity to any component.

Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.

Precautions: Drowsiness, anorexia, slight gastric distress can occur. In excessive drowsiness, consider longer dosage intervals. Persons on full dosage should not operate vehicles. Nonsusceptible organisms may overgrow; treat superinfection appropriately. Treat beta-hemolytic streptococcal infections at least 10 days to help prevent rheumatic fever or acute glomerulonephritis. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).

Adverse Reactions: *Gastrointestinal*—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. *Skin*—maculopapular and erythematous rashes; exfoliative dermatitis; photosensitivity; onycholysis, nail discoloration. *Kidney*—dose-related rise in BUN. *Hypersensitivity reactions*—urticaria, angioneurotic edema, anaphylaxis. *Intracranial*—bulging fontanels in young infants. *Teeth*—yellow-brown staining; enamel hypoplasia. *Blood*—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. *Liver*—cholestasis at high dosage.

Upon adverse reaction, stop medication and treat appropriately.

Lederle LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York 10965

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soothing relief for hair-raising cough

Benylin®
EXPECTORANT

Each fluidounce contains: 80 mg. Benadryl® (diphenhydramine hydrochloride), Parke-Davis; 12 grains ammonium chloride; 5 grains sodium citrate; 2 grains chloroform; 1/10 grain menthol; and 5% alcohol. An antitussive and expectorant for control of coughs due to colds or of allergic origin, BENYLIN EXPECTORANT *is the leading cough preparation of its kind.* BENYLIN EXPECTORANT *tends to inhibit cough reflex ...soothes irritated throat membranes. And its not-too-sweet, pleasant raspberry flavor makes* BENYLIN EXPECTORANT *easy to take.*

PRECAUTIONS: *Persons who have become drowsy on this or other antihistamine-containing drugs, or whose tolerance is not known, should not drive vehicles or engage in other activities requiring keen response while using this preparation. Hypnotics, sedatives, or tranquilizers if used with* BENYLIN EXPECTORANT *should be prescribed with caution because of possible additive effect. Diphenhydramine has an atropine-like action which should be considered when prescribing* BENYLIN EXPECTORANT.

ADVERSE REACTIONS: *Side reactions may affect the nervous, gastrointestinal, and cardiovascular systems. Drowsiness, dizziness, dryness of the mouth, nausea, nervousness, palpitation, and blurring of vision have been reported. Allergic reactions may occur.*

PACKAGING: *Bottles of 4 oz., 16 oz., and 1 gal.*

Parke, Davis & Company, Detroit, Michigan 48232

PARKE-DAVIS

50669

Nose clear as a whistle

(THANKS TO DIMETAPP®)

Dimetapp Extentabs® does an outstanding job of helping to clear up the stuffiness, drip and congestion of colds and upper respiratory allergies and infections. Each Extentab keeps working up to 12 hours. And for most patients drowsiness or overstimulation is unlikely. Try Dimetapp. It clearly works.

UP TO 12 HOURS CLEAR BREATHING ON ONE TABLET

Dimetapp Extentabs®

Dimetane® (brompheniramine maleate), 12 mg.; phenylephrine HCl, 15 mg.; phenylpropanolamine HCl, 15 mg.

FOR UPPER RESPIRATORY ALLERGIES AND INFECTIONS

Indications: Dimetapp is indicated for symptomatic relief of the allergic manifestations of respiratory illnesses, such as the common cold and bronchial asthma, seasonal allergies, sinusitis, rhinitis, conjunctivitis, and otitis.
Contraindications: Hypersensitivity to antihistamines. Not recommended for use during pregnancy.
Precautions: Until patient's response has been determined, he should be cautioned against engaging in operations requiring alertness. Administer with care to patients with cardiac or peripheral vascular diseases or hypertension.
Side Effects: Hypersensitivity reactions including skin rashes, urticaria, hypotension and thrombocytopenia, have been reported on rare occasions. Drowsiness, lassitude, nausea, giddiness, dryness of the mouth, mydriasis, increased irritability or excitement may be encountered.
Dosage: 1 Extentab morning and evening.
Supplied: Bottles of 100 and 500.

A.H. ROBINS COMPANY
RICHMOND, VA. 23220

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in cardiac edema

Dyazide®

Trademark

Each capsule contains 50 mg. of Dyrenium® (brand of triamterene) and 25 mg. of hydrochlorothiazide.

gets the water out

spares the potassium

Before prescribing, see complete prescribing information in SK&F literature or *PDR*.

Contraindications: Pre-existing elevated serum potassium. Hypersensitivity to either component. Continued use in progressive renal or hepatic dysfunction or developing hyperkalemia.

Warnings: **Do not use dietary potassium supplements or potassium salts unless hypokalemia develops or dietary potassium intake is markedly impaired.** Enteric-coated potassium salts may cause small bowel stenosis with or without ulceration. Hyperkalemia (>5.4 mEq/L) has been reported, in 4% of patients under 60 years, in 12% of patients over 60 years, and in less than 8% of patients overall. Rarely, cases have been associated with cardiac irregularities. Accordingly, **check serum potassium and BUN during therapy, particularly in patients with suspected or confirmed renal or hepatic insufficiency (e.g., certain elderly or diabetics). If hyperkalemia develops, substitute a thiazide alone. If spironolactone is used concomitantly with 'Dyazide', check serum potassium frequently**—their combined use can cause potassium retention and sometimes hyperkalemia. Two deaths have been reported in patients on such combined therapy (in one, recommended dosage was exceeded; in the other, serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage or other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium (triamterene, SK&F). Rarely, leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with the thiazides. Watch for signs of impending coma in acutely ill cirrhotics. Thiazides are reported to cross the placental barrier and appear in breast milk; thus adverse reactions which have occurred in adults may occur in the fetus or newborn infant. Rarely, thrombocytopenia or pancreatitis has developed in newborn infants whose mothers had received thiazides during pregnancy. When used during pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus.

Precautions: Do periodic serum electrolyte determinations. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in postsympathectomy patients. The following may occur: hyperuricemia and gout, reversible nitrogen retention, decreasing alkali reserve with possible metabolic acidosis, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), digitalis intoxication (in hypokalemia). Use cautiously in surgical patients. Adjust dose of antihypertensive agents given concomitantly.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis; rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting (may indicate electrolyte imbalance), diarrhea, constipation, other gastrointestinal disturbances. Rarely, necrotizing vasculitis, altered carbohydrate metabolism, hyperbilirubinemia, paresthesias, icterus, pancreatitis, and xanthopsia have occurred with thiazides alone.

Supplied: Bottles of 100 capsules.

SK&F

Smith Kline & French Laboratories

Geraldine A. Caldwell

This Journal and the Colorado Medical Society lost a truly great person, a remarkable executive, a loyal, loving servant and friend, when Geraldine Caldwell died at Presbyterian Hospital in Denver, February 5.

For twenty-one years she had been a key figure on the staff of the Colorado Medical Society and for the last eleven of those years was its Assistant Executive Secretary and staff personnel director with concomitant duties as Business Manager and Assistant Managing Editor of the *Rocky Mountain Medical Journal*. She carried out all these duties superbly. She was not only respected and admired, but truly loved by all officers and staff members of the Medical Society and by the members of our Journal's six-state Editorial Board. The same was true of all who knew her in her outside activities such as the American Association of Medical Society Executives and in the University Park Church of Christ.

Geraldine, whose surname then was Blackburn, came to the Medical Society as a staff secretary in 1949 after five years in the advertising department of Shwayder Brothers, Inc. She brought to us not only expert stenography and clerical skills but, as the Executive Secretary soon learned, a thorough business education in bookkeeping, cost accounting and personnel management plus keen appreciation of medical problems obtained from nurse's training at Denver's Saint Luke's Hospital. She was soon advanced to the position of Executive Assistant, supervising the Society's clerical employees, helping manage its conventions and willingly assuming multiple other duties for the Society and this Journal. She was appointed Assistant Executive Secretary August 15, 1959. Colorado's House of Delegates and Board of Trustees had both honored her with special recognition on completion of her first fifteen years, and again when it was twenty, with the Society. Geraldine had become Mrs. Harold R. Caldwell on February 18, 1963, but agreed to continue her work for the Society and Journal.

Now she has been taken from us. It will probably require two to carry out the multiple tasks Geraldine performed so smoothly and with such skill and tact, even when she was too often handling them all from some hospital bed—twice in the last six years she survived critical injuries in automobile accidents, and in prior years she had suffered a half-dozen serious illnesses of a month or more, three requiring major surgery. Her terminal illness, a pancreatic malignancy, was in its late stages when diagnosed last November, but in the hospital and later at home until a very few days before the end, she was constantly thinking for the Medical Society and the Journal, reading correspondence, dictating letters, answering question and asking others. She insisted upon keeping up the work; that was Geraldine Caldwell.

She was a Denver native, born March 23, 1915, and most of her education was in Denver, though her high school graduation was in Norton, Kansas. Besides her husband, Harold, she is survived by her mother, Mrs. Grace Weaver of Denver, two sisters, Mrs. Pauline Woodworth of Denver and Mrs. Christine Thomas of Lakewood, a daughter by a previous marriage, Mrs. Judith Belasco of Dearborn, Michigan, four grandchildren, five nieces and nephews, and eleven grandnieces and grandnephews. With all of them, the Colorado Medical Society and the *Rocky Mountain Medical Journal* share a grievous loss.

Colorado Winter Clinics

Colorado Medical Society
Saturday, March 14, 1970
St. Joseph's Hospital Auditorium
Denver, Colorado

7:30 a.m.—Continental Breakfast

8:30 a.m.—TRANSPLANTATION 1970
Dr. Charles Halgrimson, Chairman

Colorado's First Transplant Patient
Dr. Joseph Holmes

Two Liver Transplant Patients, Two and Six Years Later
Dr. Israel Penn

Cardiac Transplant Doing Well at Six Months
Dr. George Pappas

9:45 a.m.—ESOPHAGEAL PROBLEMS, YOUNG AND OLD
Dr. John Burrington, Chairman

Two-year-old Patient With Esophageal Atresia and Colon Interposition
Dr. Fred Grover

Sixty-four-year-old Patient With Jejunal Interposition For Longstanding Peptic Esophagitis
Dr. Fred Kern

Thirty-seven-year-old Patient With Postnecrotic Cirrhosis, Bleeding Varices, Splenorenal, Portacaval and Mesocaval Shunts in one Man, Now Cured
Dr. John Smiley

11:00 a.m.—BACK TO SCHOOL
Dr. William Waddell, Chairman

Mitochondria and Energy Metabolism
Dr. Wolff Kirsch

Information Storage and Information Flow in a Living Cell
Dr. Ernest Borek

Ribosomes and Protein Synthesis
Dr. John Stewart

12 noon—Luncheon for R.M.P. Planners, Dr. Hildebrand & Staff, St. Joseph's Hospital, Main Dining Room

This program will be televised to Dawson Auditorium, Presbyterian Hospital and the new Hospital Auditorium, Colorado General Hospital. Notwithstanding, the best place to be will be the front row at St. Joseph's Hospital. The first two sessions will be for live presentations of patients. The Back to School Session will be lively and timely. This is molecular biology for the old boys and where the action is. It is a pleasure to announce that the members of the Oklahoma Surgical Society will be guests in Denver for this meeting.

MEETINGS

The 4th Annual Swedish Hospital Lectureship

March 27, 1970

Surgical and Radiological aspects of Coronary Artery Disease

A.M. session: Swedish Hospital, 501 East Hampden, Englewood, Colorado 80110.

P.M. session: Denison Auditorium—University of Colorado Medical Center, 4200 East 9th Ave., Denver, Colo. 80220.

For further details contact Robert K. Carver, MD, Arapahoe Medical Society, 501 East Hampden, Englewood, Colorado 80110.

1970 Symposium, Southeastern Chapter, Colorado Academy of General Practice

Minnequa University Club, Pueblo, Colorado

April 26, 1970

Recent Advances in Cardiovascular Disease

For further information contact Samuel Nelson, MD, 212 Colorado Building, Pueblo, Colorado 81003.

9th Annual Seminar on Cancer of the Breast

Brown Palace Hotel, Denver, Colorado

May 14-16, 1970

For further information write to Wendell P. Stampfli, MD, Department of Radiology, St. Luke's Hospital, 601 East 19th Avenue, Denver, Colorado 80203.

Seminar on Cryosurgical Procedures in E.E.N.T.

Dunes Hotel, Las Vegas, Nevada

Sunday, October 4, 1970

Ophthalmologists and Otolaryngologists invited to attend this luncheon meeting.

For further information write: Secretary, Society for Cryosurgery, 30 N. Michigan Avenue, Chicago, Illinois 60602.

American Academy of Ophthalmology and Otolaryngology Annual Meeting

Dunes Hotel, Las Vegas, Nevada

October 5, 1970

13th Annual Ruidoso Summer Clinic

Chaparral Motel, Ruidoso, New Mexico

July 20-23, 1970

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Postgraduate Course In Laryngology and Bronchoesophagology

April 6 through 17, 1970

The Department of Otolaryngology of the Eye and Ear Infirmary of the University of Illinois Hospital and the College of Medicine of the University of Illinois at the Medical Center, will conduct a postgraduate course in Laryngology and Bronchoesophagology from April 6 through 17, 1970. This course is limited to fifteen physicians and will be under the direction of Paul H. Hollinger, MD. It will be held largely at the Eye and Ear Infirmary, 1855 West Taylor Street, Chicago, and will include visits to a number of other Chicago hospitals. Instruction will be provided by means of animal demonstrations and practice in bronchoscopy and esophagoscopy, diagnostic and surgical clinics, as well as didactic lectures.

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TOPICS—

ATHLETIC INJURIES IN CHILDREN AND YOUNG ADULTS
ORTHOPEDIC BASIC SCIENCE

SPEAKERS—

DON H. O'DONOGHUE, M.D.
Professor and Chairman
Department of Orthopedics
University of Oklahoma

JAMES S. MILES, M.D.
Professor and Head
Division of Orthopedics
University of Colorado

BLAISE E. FAVARA, M.D.
Pathologist
Director of Laboratories
Denver Children's Hospital

$30 registration fee payable in advance includes luncheon and dinner.*

***Dr. O'Donoghue will speak at the dinner meeting of the Rocky Mountain Orthopedic Society.**

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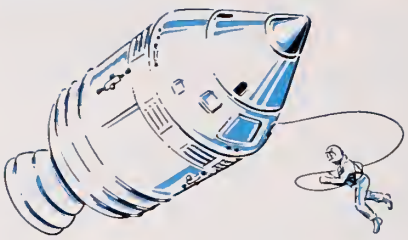

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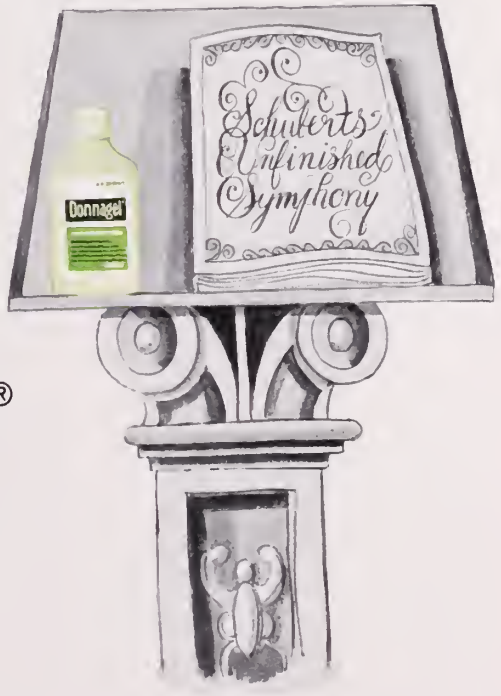

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Distribution of Medical Care—What is its Future?

CHANGES ARE coming in national health care, all the way from medical education to ultimate distribution of medical services. Students are unhappy with medical faculties; faculties are displeased with administration; administration is clashing with hospitals and insurance companies; and everybody is critical of the inroads of government, and governmental agencies are at odds with Congress and each other. Capabilities of medicine in serving the people have increased to unbelievable proportions, and demands for its services have been increased by the people and their employers, by Congress, labor and its unions, and by countless agencies responsible for its distribution. So far, over 168,000,000 Americans have some form of voluntary health insurance, but there are demands that such coverage shall be scuttled and that the government shall provide total medical care.

Predictions of $100 per day hospital charges add fuel to the flames. Tremendous expenses of Medicare and Medicaid, muddied up by fraud and chiseling, beget ruthless criticism plus demands for overhauling the administration and even the law itself. In 1968, the Medicaid program, a joint federal and state project for the needy, cost $3,500,000,000 and served 8,500,000 people. It is estimated that in fiscal 1970 it will cost $4,862,000,000 for 10,200,000 people. If still in effect in 1975 costs will probably be between $12 and $16 billion. Without refinements and economies, second-class health care is bound to follow despite its overwhelming cost. The AMA has recommended less costly rest homes and outpatient treatment wherever possible instead of hospital and nursing home facilities. It is demanding elimination of isolated but significant abuses by physicians. Medical societies and individual physicians are seeking means to somehow get health services into low-income communities, and organized medicine is continually providing more sophisticated methods to police the quality of all health care. Unless economies and efficiency are invoked, the Medicare Part B premium will jump from the present $4 per month to over $5 by next July. Social Security Commissioner Robert Ball has stated that Part A is out of balance and that an increase in the hospital portion of the Social Security tax will be required to make the program financially sound. If this is done, the rate predicted for 1987 will begin in 1970!

There is no wonder that there is much concern over how financing of health care services in the United States shall be made realistic. Many participants in the controversy believe that some nation-wide formula will be required. Some would invoke a compulsory system where private physicians provide all the health care, while others believe that the government should set up a payment system for all people who cannot pay their own way. The AMA and representative Fulton of Tennessee advocate a federal income tax credit for anyone who purchases private health insurance. The government would pay for the policies of the unemployed and at the poverty level. Walter Reuther, President of the United Auto Workers and George Meany of the AFL-CIO hope to decree through legislation the manner in which the providers of medical service shall dispense it and how they shall be paid. There is no reason to doubt that Reuther opposes private enterprise in making medical services available and in delivering them. He calls private enterprise, in this respect, inadequate. The AFL-CIO foresees a plan of about 80 per cent "across-the-board" medical expenses paid for by a government agency, established or new. The Director of the AFL-CIO's Social Security Division Bert Seidman believes that one of the greatest benefits of such a single plan would be prevention of unnecessary hospitalization. If he is right about this, we would call it a great big point in his favor, but it is doubtful that there is any one very effective answer to over-utilization of services. These editorial columns have perennially decried this evil which is so glaring in hospital practice.

It is obvious that the stage is set for a great and growing controversy at local, regional, and national levels. It is of deep concern to all people, the future of our country and, of course, the future of our profession. We should not only *watch* the evolution of the great deliberation; all of us should *participate* and make sure that our profession makes its voice heard on behalf of maintaining quality medical care regardless of the mechanism of its distribution.

The Cyclamates—Guilty or Innocent?

By the time this editorial appears in the *Journal,* the great and controversial question of the cyclamates will probably be threadbare. In fact, it became old inside of about two weeks. Hence, we only mention that on October 18 the Secretary of Health, Education, and Welfare announced that on the basis of scientific information and a provision of the Food-Drug and Cosmetic Act, cyclamate sweeteners will be restricted. Secretary Finch hastily emphasized that there is no evidence that cyclamates have caused cancer in human beings and therefore removal of cyclamates from its place among approved substances is not "life-saving" or urgent. Furthermore, products containing it will remain available for reasons of health such as in diabetes or obesity. Although malignant bladder tumors appeared in animals subjected to high dose levels of cyclamates for long periods (confirmed by a panel of the National Academy of Science), the doses were to fifty times, in proportion to weight, those to which human beings have been exposed. There is no evidence that cyclamates have caused malformation in children or any other human abnormality beyond rare cutaneous hypersensitivity.

The matter is, of course, not closed and the Secretary is in consultation with representatives of affected industries and consumer groups in order to perfect effective means for offering the products for restricted use and to provide new and safe substitutes. Abbott officials have gone along with experiments and research in order to cooperate with the Food and Drug Administration in development of new regulations. The data are presented to the National Institutes of Health, the National Academy of Sciences, and others in the Department of Health, Education, and Welfare. It is commendable that Abbott Laboratories thus re-affirm their world-wide dedication to the health and well being of all people.

We cannot help but wonder whether this power play of a government official entrusted with all matters concerning public health is justified in being hasty. Scuttling a billion dollars worth of American industry is no small matter for our country. Practically any drug or chemical you can name is harmful if used or taken in abnormally large quantities. Alcohol, tobacco, speed, pot, to name but a few, can kill—and there is ample evidence that they do so. Most of us would put the lid on these things, along with countless others, before we would the cyclamates. If we attempt to explore the question in view of morality, fairness, and justice, it would forever remain unresolved. We will note with interest the unavoidable repercussions among people, among politicians, in our profession and, of course, the pharmaceutical industry.

Prolonged naso-/and orotracheal intubation in cardiac surgery patients*

Robert DiCarlo, MD, Andres Zahler, MD†,

J. Antonio Aldrete, MD, and George Pappas, MD, Denver

Temporary postoperative assisted or controlled artificial ventilation of the lungs using a tracheal catheter can be performed through the oral pathway as an alternative to the nasal route. The advantage of having the wider oral tube is suggested by the lower incidence of pulmonary complications observed in this study.

THE NEED FOR VENTILATORY support in the immediate postoperative period in patients undergoing cardiovascular surgery has been recognized and emphasized by several authors.[1,2,3,4] This respiratory function assistance has been advocated because of the pathologic changes typical to this group of patients and also to other poor-risk patients undergoing major surgical procedures.

In this study, it was intended to compare the advantages and disadvantages afforded by the use of endotracheal catheters when inserted by the oral, versus the nasal routes, when prolonged tracheal intubation was required to maintain ventilation during the immedate postoperative period in patients having cardiovascular surgery at the Colorado General and Veterans Administration Hospitals of Denver.

Materials and Methods

A retrospective review was made of the medical records of 123 patients undergoing major cardiovascular surgical procedures for which extracorporeal circulation was necessary. All cases were anesthetized by Anesthesiology residents under supervision of Staff Anesthesiologists.

Seventy-six patients were intubated through the nose and 47 through the mouth. Table 1 lists the number of patients included in each group as referred to sex and age. The various types of surgical procedures performed are shown in Table 2. Although the total number of patients included in both groups were different, there was similarity in the age range and mean value, as well as the nature of the operation.

The factors evaluated were the technic of induction of anesthesia to permit tracheal cannulation, the size of catheter used, and

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†Deceased

the duration of the intubation, which were correlated with the incidence of respiratory complications (atelectasis or pneumonia) observed during the first week of operation. Diagnosis of these complications was established when the presence of auscultatory signs was supported by temperature elevation and radiological confirmation. Finally, the frequency of other complications such as difficult intubation, difficulty in suctioning, laryngeal malfunction and other sequelae were noted.

Results

The technic for induction of anesthesia to permit tracheal cannulation are listed in Table 3. Either inhalation or intravenous technics were used, utilizing a variety of anesthetic agents and, in most cases, facilitated by the administration of muscle relaxants.

The sizes of the tubes inserted are shown in Table 3. To select the size of the catheter, the largest tube in diameter that could easily be inserted into the glottis or into the nose was followed for the oral and nasal approaches, respectively. It was not surprising to find that only three patients were nasally intubated with tracheal tubes larger than #38 French (9.5 mm in diameter). In contrast, 16 of 44 patients intubated through the mouth had larger size tubes inserted.

With some differences, but still comparable, the length of intubation in hours, for each group, is also demonstrated in Table 3.

The incidence of non-pulmonary complications encountered with the nasotracheal and orotracheal groups is listed in Table 4. A greater frequency of traumatic sequelae was noted when the nasal approach was employed. Peculiar to this group were epistaxis, accidental removal of the tube by the patient and secondary hearing loss. Instances of extrinsic obstructions by either kinking or biting only occurred when the catheters were introduced orally.

The rate of frequency of pulmonary complications observed in both groups was correlated with the time that the catheter remained in place (Fig. 1). They occurred more

TABLE 1
SEX AND AGE VARIANTS

INTUBATION	*SEX*		*AGE*	
	Male	*Female*	*Range*	*Mean*
Nasotracheal	38	38	3 mo.-62	35.3
Orotracheal	33	14	7 mo.-68	33.7

TABLE 2
NATURE OF SURGICAL PROCEDURE

TYPE OF OPERATION	*ROUTE FOLLOWED FOR RESPIRATORY SUPPORT*	
	Nasotracheal	*Orotracheal*
Mitral valve replacement	13	8
Aortic valve replacement	14	7
Two valves replacement	6	2
One valve replacement plus other procedure	5	2
Mitral valvulotomy	8	12
Atrial septal defect	7	4
Ventricular septal defect	7	2
ASD plus other procedure	1	1
VSD plus other procedure	3	2
Other procedures	12	7
TOTALS	76	47

TABLE 3
TECHNIC, CATHETER SIZE AND DURATION OF INTUBATION

ANESTHESIA FOR INTUBATION	*INTUBATION*			
	NASOTRACHEAL		*OROTRACHEAL*	
	Number	*Percent*	*Number*	*Percent*
Barbiturate & Succinylcholine	36	47.5	29	61.0
Barbiturate & d-Tubocurarine	12	16.0	9	20.0
Inhalation alone	17	22.5	1	2.0
Inhalation & Succinylcholine	7	9.0	8	17.0
Inhalation & d-Tubocurarine	4	5.0	—	—
TOTALS	76		47	
TRACHEAL TUBE SIZE				
24 or smaller (French)	12	15.5	8	17.0
27—30	8	10.0	5	11.0
30—34	41	54.0	2	4.0
>34	15	20.0	32	68.0
TOTALS	76		47	
DURATION OF INTUBATION				
0—24 hours	26	34.0	21	44.0
25-48 hours	46	61.0	18	38.0
>48 hours	4	5.0	8	18.0
TOTALS	76		47	

TABLE 4
INCIDENCE OF NON PULMONARY COMPLICATIONS

	(76)		*(43)*	
	NASOTRACHEAL		*OROTRACHEAL*	
	Number	*Percent*	*Number*	*Percent*
Difficult intubation	6	8	4	8
Difficulty in suctioning	8	10	2	4
Apparent laryngeal dysfunction	4	5	1	2
Epistaxis	10	13	—	
Traumatic sequelae	3	4	1	2
Extrinsic obstruction (Biting or kinking)	—		1	2
Accidental extubations	6	8	—	
Hearing loss	2	3	—	
Subsequent tracheostomy	10	13	10	21

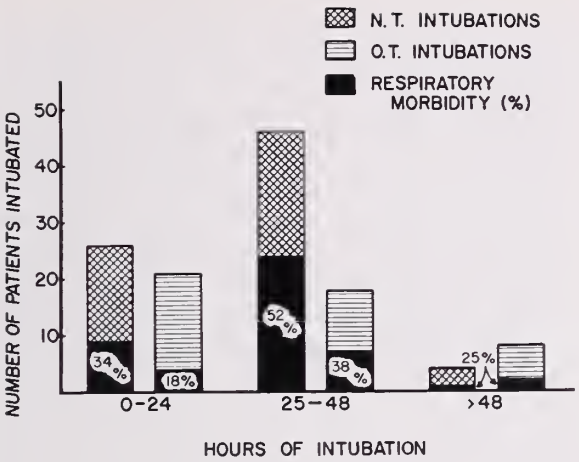

Fig. 1. Correlation of the incidence of pulmonary complications (confirmed atelectasis and pneumonia) occurring in cardiac surgery patients with the duration of naso v.s. orotracheal intubation.

frequently when nasotracheal tubes were left in place between 0 to 48 hours, whereas no percental difference was observed when they were used longer than 48 hours by either approach.

Discussion

The validity of maintaing adequate respiratory function during the immediate postoperative period has been repeatedly emphasized by the results of studies evaluating serial blood gas and pH determinations. Acidosis, hypoxemia and/or hypercarbia can frequently occur unless adequate surveillance is assiduously maintained at this time. The probabilities for development of respiratory insufficiency are even greater in patients undergoing thoracic and cardiac surgery.[6,7]

Lung and mediastinal manipulation, residual anesthetic or muscle relaxant, previous lung disease, pulmonary artery hypertension, low cardiac output, increased work of breathing, increased oxygen consumption, prolonged cardiopulmonary bypass and incisional pain are undoubtedly predisposing factors for development of respiratory complications. Hence, assistance to ventilation is a well-accepted practice for some patients after a major cardiovascular surgical procedure for which extracorporeal circulation was required.

When the condition of the patient is such that respiratory support is anticipated, this has been carried out securing airway patency by either a tracheostomy or tracheal intubation. Earlier, the former was more commonly used; however, greater experience with intermediate or prolonged nasotracheal intubation in the management of other causes of respiratory failure has afforded this latter procedure a recent surge in the care of the acutely ill patient. Intubation of the trachea by the nasal route has been thought to be better tolerated by semi-alert patients. This, however, has been recently questioned by Hedden and Safar[8] who were informed by patients having had both oral and nasal tubes that the former was better tolerated. A controlled study comparing the tolerance of both nasotracheal and orotracheal tubes in the same patient under similar conditions would be difficult to achieve. In our experience, oral catheters have not been particularly more uncomfortable to these patients than nasotracheal tubes. Patients intubated for other reasons might not tolerate orotracheal intubation as well (i.e., respiratory insufficiency).[9] The possibility of extrinsic obstruction of the tube placed in the mouth is not remote as demonstrated by one of our patients who transected the catheter by biting on it. This complication might be avoided by the adequate placement of a bite block. On the other hand, kinking of a nasotracheal tube may be more likely since it is longer and has a more tortuous pathway. Also, partial obstruction of a nasal tube would appear to be more critical than an oral because of the smaller lumen of the former. This occurred in one 4½-year-old boy, intubated for 12 hours in whom the tube had to be replaced because of apparent kinking. The possibility of causing laryngeal trauma is common to both approaches since both are placed between the vocal cords; although, due to the convexity of the upper airway, influenced by the natural lordosis of cervical vertebrae, it has been suggested that nasotracheal tubes might exert greater pressure over the posterior laryngeal structures than the orotracheal catheters.[10] This fact might have been the reason for observing only one case of laryngeal dysfunction in patients intubated orally, whereas four instances resulted with nasal intubation.

Because of the narrow nasal pathway, the diameter of tracheal tubes inserted through these orifices is limited by the individual's anatomical characteristics. As demonstrated in this study (Table 3), a considerable larger number of patients had medium-size tubes (30-35) when introduced through the nose, than when inserted orally. This fact has several consequences in detriment of nasal tubes. The smaller diameter would definitely offer greater resistance to ventilation if assisted or controlled, and would also require increased work of breathing in case of spontaneous or assisted respiration.[7] Moreover, suctioning of bronchial secretions may be more difficult since the length and curved pathway of the catheter would undoubtedly present greater resistance to the passage of the suction catheter or to the elimination of secretions coughed spontaneously. The smaller diameter would also be more likely to be partly or completely obstructed by the drying of inspissated secretions. Oral tubes, with larger diameter, do not need to be as long and, therefore, suctioning is easier to achieve. Other complications provoked by the use of nasal tubes can be obviated. Necrosis of the ala-nasi has occurred after several hours of pressure applied over this area by a malpositioned, poorly-anchored nasotracheal tube. This complication was observed in a 47-year-old male who underwent mitral and tricuspid valves replacement. The nasotracheal tube remained in place for 39 hours; then, it was replaced by a tracheostomy. The patient died five hours later. At autopsy the tracheal mucosa was ulcerated and the edge of the nostril had an area of early pressure necrosis.

During intubation trauma to the nasal turbinates or mucosa of the nasopharynx have resulted in severe epistaxis. Specifically, this latter complication is undesirable in this group of patients, since heparinization, prior to cardiopulmonary bypass, has provoked recurrence of nose bleed which sometimes has been extremely difficult to control. Epistaxis during intubation occurred in three patients, reappearing after heparinization and throughout the period of extracorporeal circulation. In a 34-year-old female intubated nasally for 29 hours, epistaxis occurred at extubation. This lasted for 10 hours and the patient required blood transfusion since the hematocrit fell from 37 to 28 per cent. Furthermore, the presence of foreign bodies such as endotracheal tube and bite blocks in semiconscious patients can also result in trauma to the bucal structures. Lip and tongue injuries can occur from involuntary biting. Teeth have also been avulsed by the same mechanism. Lesions caused by pressure over the oral commissures can be avoided by alternating the placement of the tube from one side to the other, every 12 hours.[8,9]

Signs of laryngeal dysfunction were noted in one 54-year-old female intubated orally for 29 hours with a #34 catheter. After extubation she could talk only in a "whispering fashion." At indirect laryngoscopy, granulomatous tissue was noted on the anterior wall of the trachea, subglotically at the site where an indwelling catheter was inserted for the purpose of instillating saline solution into the trachea to provoke coughing.

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Summary

The incidence of respiratory morbidity and traumatic sequelae resulting in a group of 123 cardiac surgery patients, was higher when nasotracheal catheters were used, than when the oral route was chosen. Perhaps it would be of value to correlate the type of procedure performed with the incidence of respiratory morbidity. Other possible disadvantages of nasotracheal intubation are epistaxis, transport of foreign bodies or infected mucus into the tracheo-bronchial tree, kinking, increased airway resistance and difficulty in suctioning. Since orotracheal intubation appears to be a satisfactory alternative route for the postoperative support of ventilation in the cardiac surgical patient, it is suggested that oral catheters used for the anesthetic period be left in place for continuing respiratory assistance. •

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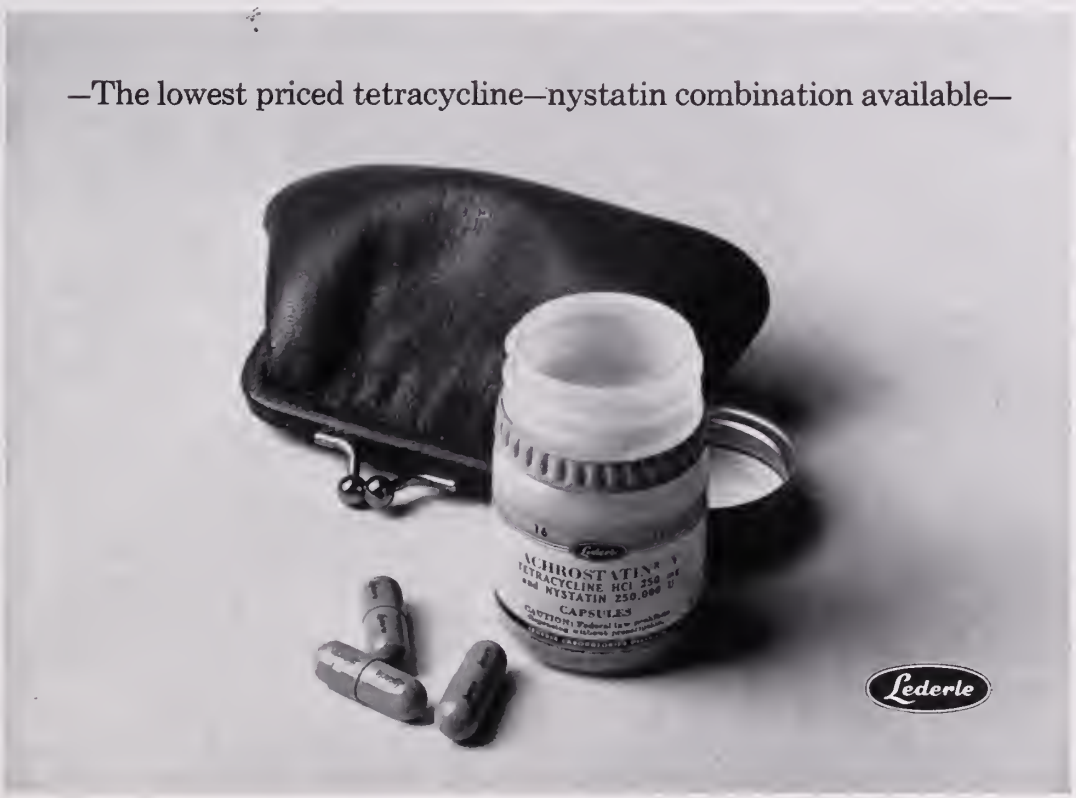

"A study of the elderly patient" in private practice*

Caroline J. Hobson, A.C.S.W., Denver

This is a report of a research project on medical care for the elderly. It provides valuable and pertinent information pertaining to the delivery of medical care in the private medical setting.

THERE IS NO AREA in the United States where greater changes are occurring than in the area of health and medical care. The Federal Government has actively organized Medicare, Medicaid, and the Regional Medical Programs and has had the opportunity to organize Health Planning Councils.

Many members of the medical profession have long been concerned about a comprehensive method of health care. They had the capacity to be introspective about proposed changes and had begun to evaluate their practice as it related to the type of health care they were delivering. The doctors in The Denver Clinic are among this group. They have been known for their efforts in the area of comprehensive medical care. Because of their interests, many members of The Denver Clinic group are serving in positions of responsibility and leadership in their state and local medical societies. They are also serving as members of voluntary health organizations and as volunteers in community medical activities.

"The aging population has increased in the United States. Older people have become more visible. They have doubled in numbers very rapidly btween 1900 and 1930 and again between 1930 and 1950. It is now possible to identify them in three stages of advanced adulthood: Middle Age, Later Maturity and Old Age. These are defined as:

Middle Age: The stage of adulthood marked by considerable changes; physiological changes where most people become aware of declining energy, an increasing recognition of the need to look to mental activity as the source of ego rewards; changes in visual and auditory acuity usually occur during the fifth decade. Chronic illness is prevalent. Women commonly pass through the menopausal period at this time.

Later Maturity: Between 60 and 70 years of age most individuals become aware of a marked diminution of energy reserve, are fully aware of sensory losses and have experienced the onset of some long-term chronic health condition. Retirement comes to most persons during this period and with it reduction in income. The individual may be able to integrate a lifetime of experience and friendships."[1]

Old age: There is a general decline in the state of health during this period; a notable increase in debilitating disease; and psychological processes are slowed down. The person in this age group turns to self-contemplation, retrospection and concern with the meaning of life.

In all the above stages, the focus is on the changes that occur in the older person's physical and mental health. As older people reach "later maturity and old age", there is a real need for them to receive responsible medical care.

The report of the National Commission on Community Health Services states, "that there be increased research and demonstration efforts to develop improved methods of organization and delivery of health services and to improve the quality of such services."[2] The doctors of The Denver Clinic decided to conduct a study that would be in line with this recommendation, but one limited to the older segment of Clinic patients.

*Supported by a grant from Title III of The Older American's Act of 1965 and The Medical Care and Research Foundation and carried out under the auspices of the doctors in The Denver Clinic, 701 East Colfax Ave., Denver.

The Project: Medical Aid in Total Environment, also known as MITE, was proposed to the doctors of The Denver Clinic and they participated in organizing an interviewing tool. They suggested questions to be included in the questionnaire that was to be used as one of the principal investigative instruments. It was felt by the investigative team that the basic rapport that existed between the doctor and his patients could provide the essentials of the relationship necessary to conduct an interview with a group of patients seen in this private medical setting. The questionnaire was structured to find out in depth, by a survey method, some of the identifying characteristics of this group of patients who were over age 65.

Project MITE's goals involved an awareness of the increasing demands made on the time and energy of the physician in providing for the health needs of the elderly patients as well as other patients.

From reading and studying other research efforts into the needs of the elderly, the Project Team and the doctors envisioned that the elderly patient would need the services of established community agencies and that there would be a need for additional paramedical personnel to assist the physician.

The National Commission on Community Health Services stated in their report, "Health Is a Community Affair," that "every individual should have a personal physician who is the central point for integration and continuity of all medical and medically related services to his patient. Such a physician will emphasize the practice of preventive medicine, both through his own efforts and in partnership with health and social resources of the community. He will have knowledge of the access to all health resources of the community—social, preventive, diagnostic, therapeutic and rehabilitative—and will mobilize them for the patient. He will be aware of the social, emotional and environmental factors that influence the health of his patient and his patient's family. His concern will be for the patient as a whole and his relationship with the patient must be a continuing one. In order to carry out his coordinating role, it is essential that all pertinent health information be channeled through him regardless of what institution, agency or individual renders the service."[3]

It was a premise of Project MITE that the patients to be included, those that were in the random sample and those 30 who were actually interviewed, could be a segment of the aging population about which little is known. The group of patients over age 65 that are seen at The Denver Clinic had had continuity in their medical care.

In their level of adjustment in their family and social relationships, they appeared to be a stable group. The group of patients were not necessarily representative of the Clinic's patient population. It was agreed, however, that there was a definite need to study these older patients and to know more about them. The Survey Team chose these patients because they were mobile, ambulatory and, of course, had been coming to the Clinic for care.

In developing the questionnaire, the Survey Team sought consultation and asked for suggestions from the Project's Advisory Board and Technical Review Committee. The Project's Advisory Board was composed of representatives of health and welfare agencies in the community, members of the legal profession, educators, a psychiatrist as well as the Secretary of State for Colorado and a clergyman. These people served as representatives of the consumers of health services of the community. The Technical Review Committee served as a group of five professional consultants to the Project Survey Team. They were also the liaison with the Colorado Commission on the Aging which was the agency through which the grant was given to the project to provide partial funding. These community contacts proved to be of value in several areas: in formulating the questionnaire and in giving visibility to the project as an instance of continuing care in a private medical setting. Private Medical settings in the past have rarely participated in social research. If done more generally, the results would be of value to the entire community. The usual contribution of the private physician has been to offer his time and his skills as a volunteer physician in an official community hospital or an out-patient department.

The patients seen in the out-patient clinics of large community hospitals have been those whose needs have been most studied. Research projects have recorded their needs and their problem areas. To the knowledge of the MITE Survey Team, no research has been done to identify the needs and characteristics of the patient who seeks private medical care, follows the advice of his doctor and pays his own bills. The doctors who sponsored MITE initiated the survey among their own patients. Each patient was seen at the doctor's office, in the environment where the doctor practiced his skill in treatment. It is in this setting where the doctor-patient relationship is strongest and where it can be observed to function at its maximum level.

The doctor participated in the interview phase of the project and he gave permission for the patient to be interviewed by others. He served as a type of screening person and determined which patients were physically and mentally able to participate in the interview, and he explained the Project to the patient before the interview process was started.

The interviewers identified themselves to the patient at the beginning of the interview as being part of The Denver Clinic. The interviewer participated in the relationship as part of that which exists between the doctor and his patient. The ability of the interviewer to establish rapport by identifying with the doctor enhanced the patient's responsiveness in the interview. In my experience, as a member of the interviewing team, the patient's responsiveness to me, influenced by identification with the doctor, permitted me to establish rapport quite easily. It permitted the patient to be more comfortable in answering the questions contained in the questionnaire. The ability of the individual interviewers to be aware of and to utilize the dynamics of the doctor-patient relationship identified the differences in the way the patient responded to the interviewer and influenced the results that were found with the questionnaire.

The Survey established that 81 per cent of the patients would accept a nurse and other paramedical persons if sent by their doctor. This finding contributed to the plan of The Denver Clinic to establish a Social Service Department to serve as an extension of the doctor's services. This has been in force since January, 1968 and has contributed substantially to the Clinic's effectiveness.

One of the biases which exist in the data is that patients chosen for the survey were only Denver Clinic patients. Yet it is significant that some of the patients were able to be critical of the medical care they received and to discuss the possibility that they planned to change doctors; usually, however, to another doctor in the Clinic. These patiets did not apear to be interested in seeking another doctor outside of The Denver Clinic.

It is hoped that the information gained in this project will provide data and direction for other research efforts. The research entity at The Denver Clinic is the Medical Care and Research Foundation. This Foundation assisted financially with Project MITE, with partial funding. The Project received the balance of its funds from Title III of The Older American's Act of 1965, through the Colorado Commission on Aging of the Colorado State Department of Public Welfare. The entire project was under the auspices of The Denver Clinic.

The following are selected tables of the data compiled in Project MITE. Due to limitations of space, the choice of data has been the author's.* It is believed that the tables speak for themselves. The data of MITE was compiled by Dr. Joseph F. Whiting, Ph.D., Director, Division of Manpower Research and Development, American Psychiatric Association, Washington, D. C.

The patients surveyed in Project MITE were predominantly female, most of whom ranged in age from 65 years to 79 years. Twenty-two per cent of the patients in the Survey have had eight years or more of school. Another twenty-two per cent of the total sample have had thirteen to fifteen years of school making forty-four percent of the total patients seen having education at eighth grade level or above. Eighty-nine per cent of the patients surveyed had been married or were still married. There were 266 patients or eighty-nine percent who were maintaining their own living arrangements.

*The complete report is available from: Medical Care and Research Foundation, 701 East Colfax Avenue, Denver, Colorado 80203.

TABLE 1
SEX OF PATIENTS IN PROJECT MITE

	No. of Patients	% in Study
Male	92	31
Female	207	69
Not Recorded	1	<1
Total	3DD	1DD

TABLE 2
AGE OF PATIENTS IN PROJECT MITE

Age by years	No. of Patients	% in Study
65-69	89	3D
7D-74	99	33
75-79	71	24
8D-84	28	9
85-89	11	4
Unknown	2	< 1
Total Patients	3DD	1DD

TABLE 3
YEARS OF SCHDDL COMPLETED

Years in School	No. of Patients	% in Study
1-7 Years	34	11
8 Years	51	17
9-11 Years	47	16
12 Years	58	19
13-15 Years	65	22
16 Years	18	6
17-19 Years	17	6
2D Years or more	1D	3
Total	3DD	1DD

TABLE 4
CURRENT MARITAL STATUS

Marital Status	No. of Patients	% in Study
Single	22	7
Married	144	48
Widowed	121	41
Divorced	13	4
Total	3DD	1DD

TABLE 5
YEARS WITHOUT MOST RECENT SPOUSE

Years	No. of Patients	% in Study
1-3 Years	22	7
4-7 Years	23	8
8-11 Years	18	6
12-15 Years	21	7
16-19 Years	8	3
2D or more years	42	14
Spouse Living	144	48
Single Patients	22	7
Total	3DD	100

TABLE 6
YEARS AS CLINIC PATIENT

Years	No. of Patients	% in Study
D-1 Years	54	18
2-3 Years	49	16
4-7 Years	62	21
8-11 Years	54	18
12 or more years	79	26
Do not know	2	1
Total	3DO	1DD

TABLE 7
NUMBER OF DDCTORS SEEN DTHER THAN AT CLINIC

No. of Doctors	No. of Patients	% in Study
None	133	44
1 doctor	110	37
2 doctors	4D	13
3 doctors	14	5
4 doctors	1	<1
5 or more doctors	2	1
Total	300	1DD

TABLE 8
PATIENT PERCEPTION MEDICAL CARE
COST OF MEDICATION, EXPENSIVE

Patient's Reply	No. of Patients	% in Survey
Yes	185	62
No	88	29
Sometimes	14	5
Do not know	13	4
Total	3DO	100

TABLE 9
PATIENT PERCEPTION MEDICAL CARE
SATISFIED WITH YDUR MEDICAL CARE

Patient's Response	No. of Patients	% in Survey
Very Satisfied	268	9D
Partially Dissatisfied	11	4
Satisfied	19	6
Dissatisfied	1	1
Very Dissatisfied	0	D
Oo not know	1	1
Total	3DD	1DO

TABLE 10
PATIENT PERCEPTION MEDICAL CARE
DOES YDUR DDCTDR ALLDW TIME TD DISCUSS
THE THINGS YOU WANT TO KNOW

Patient's Response	No. of Patients	% in Survey
Always	255	85
Usually	34	11
Never	5	2
Does not discuss	6	2
Total	3DD	100

TABLE 11
PATIENT PERCEPTION MEDICAL CARE
DOES YOUR OOCTOR DISCUSS THINGS
WHICH CONCERN AND BDTHER YOU

Patient's Response	No. of Patients	% in Survey
Always	244	82
Usually	28	9
Never	9	3
Does not discuss	19	6
Total	3DO	1DD

TABLE 12
PATIENT PERCEPTION MEDICAL CARE
WHY DO YDU COME TD THE CLINIC?

Patient's Response	No. of Patients	% in Survey
Prefer Clinic set-up	118	4D
Do not prefer Clinic	24	8
Oo not know	15	5
Prefer personal physician	1D9	36
Reputation of Clinic	19	6
Convenient location	3	1
Do not usually come to Clinic	4	1
Dther	5	2
Immaterial	3	1
Total	3DD	1DD

TABLE 13
PATIENT PERCEPTION MEDICAL CARE
HAS COST OF CARE KEPT YDU FROM SEEING
DOCTOR AS OFTEN AS YOU LIKE

Patient's Response	No. of Patients	% in Survey
No	247	83
Occasionally	25	9
Oo not know	13	4
Yes	9	3
Not since Medicare	4	1
Unknown	2	1
Total	3DD	1DD

TABLE 14
PATIENT'S LIVING ARRANGEMENTS
LENGTH OF RESIDENCE IN STATE

Patient's Response	No. of Patients	% in Survey
Less than 1 year	3	1
1-3 years	9	3
4-6 years	6	2
7-1D years	8	3
11-15 years	15	5
16-35 years	54	18
Native born	73	24
Over 35 years	13D	43
Not applicable	2	1
Total	3DD	1DO

TABLE 15
PATIENT'S LIVING ARRANGEMENTS
LENGTH OF RESIDENCE IN NEIGHBORHOOO

Patient's Response	No. of Patients	% in Survey
Less than 1 year	23	8
1-3 years	56	19
4-6 years	43	14
7-10 years	27	9
11 years or more	15D	50
Not applicable	1	<1
Total	3DD	1DO

TABLE 16
PATIENT'S LIVING ARRANGEMENTS
DESCRIPTIDN OF LIVING ARRANGEMENTS

Patient's Response	No. of Patients	% in Study
Live in own home, room apt. or hotel room	266	89
Live in relative's home	17	6
Live in friend's home	3	1
Live in Extended Care facility or nursing home	5	1
Other	9	3
Total	3DD	1DD

TABLE 17
PATIENT'S FINANCES
ARE YDU RETIRED?

Patient's Response	No. of Patients	% in Study
Yes	2D1	67
Still employed	21	7
Partially employed	11	4
Have never worked since marriage	30	10
Have never worked	26	9
Other	10	3
Unknown	1	<1
Total	3DD	100

TABLE 18
PATIENT'S FINANCES
ARE YOU RECEIVING MEDICARE BENEFITS?

Patient's Response	No. of Patients	% in Study
Yes	294	98
No	5	2
Oo not know	1	1
Total	3DD	1DD

TABLE 19
PATIENT'S FINANCES
DO YOU USE MEDICAL SERVICES MORE
SINCE MEDICARE BEGAN?

Patient's Response	No. of Patients	% in Study
Yes	18	6
No change	288	76
Do not know	6	2
Not on Medicare	3	1
No	11	4
Yes, due to new health problems	31	10
Use less	3	1
Total	3DO	1DO

TABLE 2D
PATIENT'S FINANCES
HOUSE CALL MADE BY NURSE SENT BY DOCTOR

Patient's Response	No. of Patients	% in Survey
Would Accept	244	81
Would Not Accept	41	14
Do Not Know	15	5
Total	300	100

Sixty-five per cent, or 195, of those surveyed had been patients of The Denver Clinic four years or more. Forty-four per cent of the patients surveyed saw no other doctor than those at The Denver Clinic.

Two-hundred seventy-two of the patients interviewed had lived in the State of Colorado eleven years or longer. Fifty per cent, or 150 patients, have lived in their neighborhood eleven years or more.

Summary

The patients seen in Project MITE were well educated, maintained their own living arrangements and were predominantly female. They have a pattern of continuity in getting their medical care. Their living arrangements do not appear to be mobile. It appears that these people lend stability to their neighborhoods and to their community.

Medicare has not changed their pattern of seeking medical care in seventy-six per cent of the Survey. It is significant that eighty-one per cent of these patients would accept a house call made by a nurse or other ancillary personnel if sent by their doctor.

The provision of comprehensive medical care should be the responsibility of private medicine. It may mean that it can be accomplished only in partnership with federal and state governments. However, the focus of any successful health program is a meaningful responsive dialogue between the physician and the consumers in the community he serves. •

SHORT BIOGRAPHICAL SKETCH

Caroline J. Hobson is the social worker in the Social Service Department of The Denver Clinic, 701 East Colfax Avenue, Denver, Colorado. Miss Hobson has a B.S. from the University of Utah; an M.A. in Medical Social Work from Indiana University Graduate School of Social Service. She is a member of the Academy of Certified Social Workers. She serves as a volunteer with the Colorado Tuberculosis and Respiratory Association and represents Colorado on the Board of the National Tuberculosis and Respiratory Association and represents Colorado on the Board of the National Tuberculosis and Respiratory Disease Association.

Material for this article was collected while Miss Hobson was a member of Project MITE Survey Team.

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[3] Ibid, p. 8.

Doctor-patient relationship in panel practice*

W. L. Reimers, MD, Denver†

I BELIEVE that a warm doctor-patient relationship is an important ingredient of quality medicine, but I am not here as an authority on what is an ideal doctor-patient relationship. I do not think that such an authority exists. This is a problem in human relations, and like in politics, religion, love and conversations with teenagers, it is difficult to agree even upon definitions. Nevertheless, the bond between the doctor and his patient is an extremely variable one, ranging through a wide spectrum—from an intimate first-name association often seen in the carriage-trade to the impersonalized, business-like approach seen often in institutional and military medicine. Most medical care lies somewhere between these extremes—fortunately, I think. As long as the quality is good and an agreeable rapport exists between the doctor and his patient, who is to say this system is good or that one is bad? Complaints arise when either the doctor or the patient is forced into a relationship in which he is uncomfortable.

I am a strong proponent of a pluralistic and multi-faceted approach to medical care with a variety of private enterprise systems available to the consumer, who is free to exercise a real choice. Choice is essential to consumer satisfaction in any market. Such a market-place of health delivery plans can also do much to promote quality of care. I happen to believe that General Motors improves its cars from year to year because it knows Ford is doing the same, and both are stimulated by the presence of Chrysler.

During the past several months many doctors in Colorado have spent many hours creating alternative methods of health care—not so much to replace old ones as to provide a greater choice of new ones to a restive and grumbling public. Three main concepts of panel practice have evolved: The Metro Foundation, Blue Shield, and the Permanente Medical Group. More are certain to come. As long as these panels are firmly controlled by doctors, the quality of medicine is good, and the individual consumer has a choice between them, I enthusiastically support them all. It has been especially gratifying to see good old staid, and sometimes self-righteous, Blue Shield willing to take stock of itself and to come out with its own panel plan. It almost makes it respectable for the rest of us. I welcome their entry into this field and hope their plan will receive wide support from the doctors of this state. After all, any organization with this remarkable flexibility can't be all bad.

It is also refreshing to me to see all of these proposals coming out of the private sector of medicine. It is my belief that government intrusion into this field of panel practice would be destructive to the doctor-patient relationship. I know of no governmental function, medical or otherwise, that

*Presented before the Colorado Medical Society annual session, Sept. 20, 1969.

†Chief of Surgery, Colorado Permanente Medical Group.

is characterized by its efficiency, its economy, its quality, or the warmth of its service.

Though we may not like all the changes we see occurring on the medical scene today, we cannot deny that the relationship between a doctor and his patient is changing and will continue to change. If such a relationship is not mutually satisfactory, it must change. Neither party of this agreement can force its will upon the other. No one wants to be either a "captive patient" or a "captive doctor." To avoid this, both the patient and the doctor should be free to choose a delivery system in which he wishes to participate. It has been said that solo practice is doomed and that group practice is the way of the future. Though the trend seems clear to me, I do not agree that solo practice is dead. There will always be a large number of patients and doctors who prefer this age-old custom. I think it would be tragic for a system to be imposed upon this nation that would restrict this type of medicine. Equally tragic, however, would be the insistence upon tradition, blind to the needs and wishes of the patients and doctors who would be happier under a different approach. Just as in religion, each denomination of medical care can prosper in the presence of many others, as long as the goal is worthy. That goal obviously must be quality medical care. I have no quarrel with the free-choice-of-physician concept except that it doesn't go far enough. I do not wish to restrict the consumer's choice of physician as long as he wants that choice and feels qualified to exercise it. Rather, I propose to expand his choice to include not only a choice of physician but also a fair choice of alternative health care programs. I would like to pose a question which I think is pertinent to this discussion. Is it not one thing to say to a patient "you may choose a physician" and quite another to say "you must choose a physician"? Should he not, in all fairness, be permitted to choose a group, a panel or an institution to supervise his care if he so wishes?

Another point of clarification of the concept of choice seems necessary. The choice should be made by the individual subscriber and not by his group leader or the majority vote of his group. For example, if 60 per cent of a union group prefer Aetna and 40 per cent prefer Blue Shield, that 40 per cent should not be obligated to accept the will of the 60 per cent. Each member should be free to exercise his own personal choice when adequate alternatives are offered to him.

Another long-standing defect of our insurance system deserves our attention. Too often in the past, no one has bothered to explain to the subscriber the fine print or legal jargon of his policy. (Incidentally, in this regard, Blue Shield should be complimented for its remarkable clarity in explaining the new panel plan in their booklet.) Unfortunately, the patient often thinks he has good coverage, when he does not. The patient must know where he stands financially and must know what he can expect from his insurance program. I think that organized medicine should insist upon "the truth in packaging" principle from all health plans. I am angry when I buy a half-empty package of cereal and I can readily sympathize with the patient who finds he has bought a half-empty health package. It is tragic to see a warm doctor-patient relationship exist during the course of a difficult illness, only to have it smashed when the inadequacy of the patient's insurance program comes to light some weeks later. Certainly the financial impact of medical care upon the patient has much to do with the whole subject of the doctor-patient relationship.

As an organized profession, we must abandon our policy of "father knows best" and work cooperatively with the consumer to provide what he wants and needs. In this market-place of medical care, the Medical Society must not place itself in the position of a salesman promoting a single product, but should be a referee of quality over the entire market. Secretary Robert Finch phrased it well recently when he said doctors must be "watchdogs of costs and guardians of quality." I would like to see us willingly accept that challenge before this responsibility is assumed by someone else. •

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Pulmonary scanning - -

Its value and validity

Jon D. Shoop, MD, Albuquerque, N. M.

An analysis of the first fifty (50) cases of isotope scintiscanning of the pulmonary circulation at a general hospital.

Disorders of the pulmonary circulation, primarily pulmonary embolization with and without infarction, can be difficult to recognize in either the acute or chronic form. Review of the experience at Bernalillo County Medical Center, Albuquerque, New Mexico, from December 15, 1968, to May 4, 1969, resulted in an increased awareness of pulmonary circulatory disorders, due primarily to the utilization of an apparatus for pulmonary scintillation scanning.

Although validity of the procedure has been established in many medical communities, each institution must establish its own evaluation of the procedure, primarily as an educational maneuver. In the institutions where pulmonary scanning is available, and the medical staff has become aware of the extent of the problem and the ease of obtaining confirmatory evidence, the phrase "if you think of embolus, think scan" has become a useful one. The subsequent portions of this paper illustrate the findings and criteria established at our institution.

The use of radioactive particulate matter to map the pulmonary circulation was first introduced in 1964, separately, by Wagner[6] and Taplin.[5] Earlier experimental studies by Weibel had confirmed the presence of 280 billion capillary segments within the lungs, arising from the consecutive branching of the pulmonary arterioles, and having a diameter of 10-50 microns. Since satisfactory radioactivity for scanning purposes can be achieved with as few as 1 million radioactive particles of 10-50 micron size, there is no observable hemodynamic effect from the blocking of roughly 1:250,000 capillaries, despite clinical attempts to demonstrate such changes.[3]

Distribution of the approximately 1 million injected particles in the pulmonary vascular bed is based on two important factors, complete mixing of the particle suspension in the pulmonary blood stream due to right atrial and right ventricular action, and essentially complete extraction of the 1-50 micron particles by the capillary bed on the initial passage into the bed. Factors of gravity (patient position), pulmonary venous resistance, and rate and depth of respiration also affect the particle distribution. Homogeneity of distribution in the normal lung occurs when the patient is supine, breathing quietly, and the injection is made through several respiratory cycles. Comparison of the distribution obtained by differential bronchospirometry reveals a correlation of 0.98, with a confidence limit of .001, indicating a very high degree of accuracy and reliability of the particle method in comparison to the usual standard.[1]

The use of injected I-131-MAA particles in patients in the last five (5) years has been without parallel in avoidance of patient discomfort, allergic reaction, and radiation damage, and has resulted in availability of critical clinical information never before possible in a wide spectrum of ill patients.

*From the University of New Mexico School of Medicine, Albuquerque, New Mexico.

No physical harm has resulted, either mechanical or radiative, in the tens of thousands of patients so far examined by this technique. Radiation dose per scan is the same order of magnitude as yearly background radiation to the entire body, and the lung dose is only 1/5 of that received at the more rigorous pulmonary arteriogram.[7]

In addition, this method has been able to demonstrate the arterio-capillary perfusion of the lungs in a minimum of time (30 minutes), with a geometrically accurate, life-sized readout, allowing for ease in comparison with chest radiographs. Subsequent laboratory confirmation (ECG, LDH, aspiration of bloody pleural effusion) has usually been helpful in further establishing the diagnosis.

Materials and Methods

During the period of the study fifty (50) patients received at least one pulmonary scan, five (5) patients were scanned twice, and two (2) of these received a third scan as well. The final diagnosis was established in each instance, either by autopsy, clinical course, or laboratory, x-ray, and pulmonary scan findings in combination with clinical information. Table 1 indicates the established diagnoses.

At the time of the initial scan 3/5 of the patients had significant respiratory symptoms, either pain, cough, dyspnea, or a combination, and these symptoms prompted the referral for scanning. An additional 1/5 were referred because of abnormal chest x-ray findings without symptoms of pulmonary embolic disease, and the last 1/5 were scanned to obtain additional information about the cardio-pulmonary status in certain disease states. Table 2 and Table 3 indicate, respectively, the relationship between diagnosis and symptoms, and x-ray findings at time of scanning.

Criteria for the clinical diagnosis of pulmonary embolization without infarction were: positive lung scan, negative chest x-ray for consolidation or effusion, normal or equivocal LDH level (under 400 units), combined with chest pain localized to the side of the scan lesion, and no fever or sputum production initially or subsequently. Table 4 summarizes these findings in this group.

TABLE 1

DIAGNOSIS OF 50 LUNG SCAN PATIENTS

Pulmonary Embolus		26
with Infarction	20	
without Infarction	6	
Pneumonia		9
Atelectasis		5
COPD		4
Pulmonary Fibrosis		2
Mitral Stenosis		1
Broncho-pleural Fistula, chronic		1
Tuberculosis, active		1
Pyelonephritis		1
		50

TABLE 2

SYMPTOMATOLOGY AT TIME OF SCANNING

	Symptomatic	Asymptomatic
Pulmonary Embolus	18	8
Pneumonia	5	4
Other	5	10

TABLE 3

X-RAY FINDINGS AT TIME OF SCANNING

	Abnormal Chest Film	Normal Chest Film
Pulmonary Embolus	18	8
Pneumonia	7	2*
Other	13	2

*Both patients in this category had abnormal chest x-rays within 36 hours after scan.

TABLE 4

SUMMARY OF FINDINGS

Pulmonary Embolus without Infarction

Positive Scan	Abnormal X-Ray	LDH over 400
6/6	2/6*	0/4**

*In one instance the right pulmonary artery was abnormal; in another, atelectasis of minimal degree was noted basally, on one chest film.
**2/6 did not have LDH performed.

TABLE 5

SUMMARY OF FINDINGS

Pulmonary Embolus with Infarction

Positive Scan	Abnormal X-Ray	LDH over 350
19/20*	18/20	18/20

*One patient not scanned until three (3) weeks after symptoms, but chest film and LDH abnormal early.

Criteria for the clinical diagnosis of pulmonary embolization with infarction were: positive lung scan, chest x-ray positive for consolidation and/or pleural effusion, positive pulmonary angiogram or elevated pulmonary pressure on catheterization, abnormal or equivocal elevation of serum LDH values, clinical symptoms, initial or eventual, corresponding to pulmonary infarction. Table 5 summarizes the findings in this group.

Illustrative cases

By way of illustration the following case histories and appropriate scans are presented. In all but one instance the cases presented have autopsy proof, the exception was proven by angiography, and appropriate laboratory and clinical information.

For comparison, a normal pulmonary scan is included, in which the lower left lung activity is not equal to the right because of partial eventration of the left diaphragm; however, the homogeneous distribution of the activity, and the smooth convex borders of the visualized lungs constitute an intrinsically normal appearance (Fig. 1).

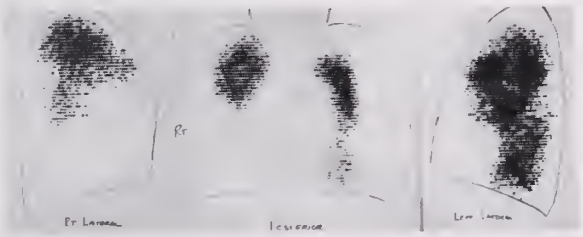

Fig. 1. Normal lung scan in asymptomatic 20-year-old female. High left diaphragm position as an incidental finding.

CASE 1

A 61-year-old male, chronic alcoholic, chronic obstructive pulmonary disease (COPD), admitted with acute intoxication. During subsequent hospitalization the patient developed fever, bilateral lower lobe and right middle lobe infiltrates on chest x-ray. Although LLL infiltrate cleared partially the RML and RLL changes progressed, and patient's clinical condition deteriorated. Scan revealed absence of perfusion in both lung apices, the characteristic pattern of COPD with apical bleb formation. In addition, however, there were localized perfusion defects of the posterior RLL and LLL regions, and a wedge-shaped perfusion defect on right lateral corresponding to RML (Fig. 2).

Portmortem examination two (2) days after scanning revealed bilateral apical subpleural blebs of moderate extent, and pneumonia of posterior segments of LLL and RLL, and of RML.

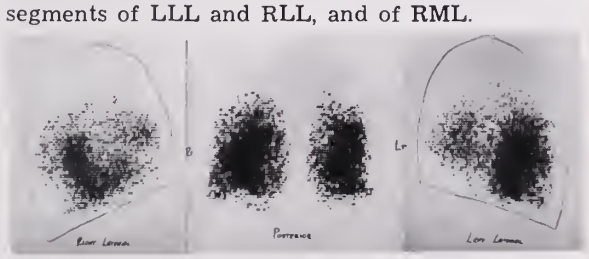

Fig. 2. Case 1. 61-year-old male with COPD and bilateral pneumonia, RML, RLL, LLL. Apical and segmental scan defects of secondary type documented at autopsy.

CASE 2

A 61-year-old female, 4½ months post-op replacement of mitral valve, satisfactory recovery until following several episodes of cardiac arrythmia, developed leg edema, then cough, chest pain, and dyspnea; taking Coumadin. Chest x-ray revealed cardiomegaly and a large right pleural effusion, congested pulmonary vessels, but no localized parenchymal abnormality in either lung. LDH was over 2,000 units. Lung scan revealed normal perfusion of the upper lung fields bilaterally, absent activity in the lower ⅓ of the right thorax (due to pleural effusion), and crescentic perfusion defects occupying the region of apical and posterior RLL, and apical and lateral segments of LLL, an appearance most consistent with pulmonary emboli, with infarction on the right (due to presence of fluid) (Fig. 3).

Postmortem examination fifteen (15) days after scan revealed pulmonary hypertension changes, and evidence of old pulmonary emboli in several areas.

Fig. 3. Case 2. 61-year-old female five (5) months post-operative mitral valve replacement, with recurrent arrythmia, CHF, chest pain. Scan reveals multiple perfusion defects, confirmed as emboli at autopsy.

CASE 3

A 50-year-old female, six (6) weeks post-craniotomy for parasagittal meningioma, with sudden syncopal attack on first visit to Physical Therapy, later the same day, some dyspnea but minimal chest pain.

Chest x-ray after the above episode did not appear changed from previous studies. Chest film the following morning, however, revealed decreased markings in the LLL region, and a mediastinal mass at the level of the SVC, not previously present (Fig. 4, upper left).

Lung scan at the same time as chest film revealed greatly diminished perfusion of the right upper and posterior right lower lung, and the antero-lateral left lung, an appearance consistent with multiple pulmonary emboli, without infarction (Fig. 4, bottom). Angiographic examination of the superior vena cava and pulmonary arteries performed subsequently revealed acute dilatation of the SVC, and multiple filling defects in branches of the pulmonary arteries bilaterally, with absent

peripheral perfusion (Fig. 4, upper right). Subsequent chest x-rays revealed consolidation and pleural effusion indicating bilateral pulmonary infarction, late scans revealed some restoration of pulmonary circulation.

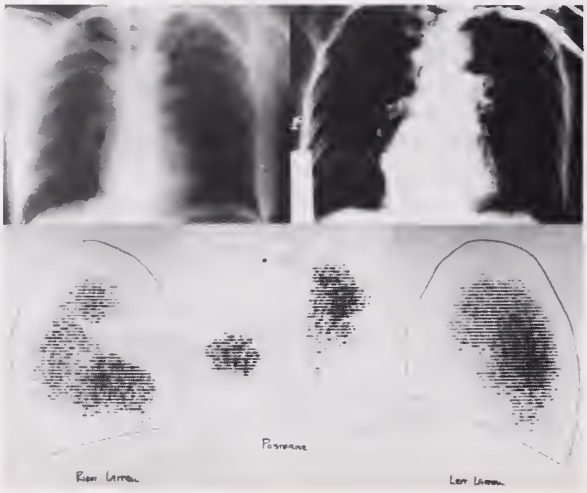

Fig. 4. 50-year-old female, six (6) weeks postoperative craniotomy, dyspnea, mild chest pain, syncope after physical therapy. Scan reveals multiple bilateral perfusion defects, chest film reveals acute SVC dilatation and decreased LLL markings, pulmonary arteriogram demonstrates several pulmonary emboli in main segmental arteries.

CASE 4

An 87-year-old male with history of CHF, sudden onset of non-radiating right chest pain, slight increase in dyspnea.

Chest x-ray revealed infiltrates of left and right lower lobes and a small left pleural effusion.

Lung scan revealed localized perfusion defects in lateral RLL, posterior LLL, and upper lateral left mid-lung. In view of the chest x-ray findings, including a scan defect where an x-ray change existed, the diagnosis of pulmonary emboli, multiple, with infarction on the left was suggested (Fig. 5). Subsequent scan and chest x-rays revealed gradual clearing, patient placed on heparin.

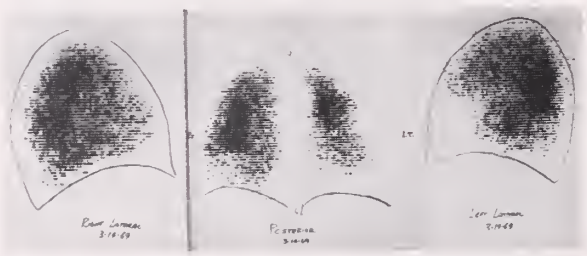

Fig. 5. 87-year-old male, long-standing CHF, recent right chest pain. Scan reveals localized perfusion defects, one in left lung where chest x-ray was normal, other corresponding to chest x-ray changes. Findings interpreted as pulmonary emboli with infarction.

Some 2½ weeks later, however, despite continued anti-coagulation, an episode of hypotension and tachypnea ensued. Chest x-ray remained clear except for some right lung infiltrate.

Lung scan revealed a marked change since the previous study, with perfusion of only the apical and posterior RUL on the right, and segmental defects of the apical and lateral basal LLL (Fig. 6).

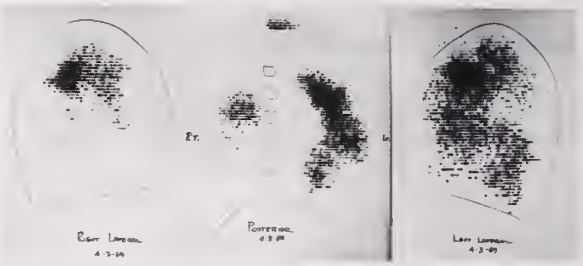

Fig. 6. Same patient as Fig. 5, 2½ weeks later despite heparinization, hypotension and tachypnea ensued. Scan now reveals more extensive bilateral perfusion defects, again interpreted as emboli with infarction.

Appropriate medical management resulted in gradual improvement over the ensuing two (2) weeks.

Repeat lung scan indicated partial restoration of right perfusion, but significant decrease in bilateral upper lobe perfusion, changes interpreted as evidence of continued embolic phenomena (Fig. 7). Six (6) days after the last scan refractory pulmonary edema occurred, and the patient expired. Postmortem examination revealed multiple bilateral pulmonary thrombi, and two relatively recent RLL pulmonary emboli.

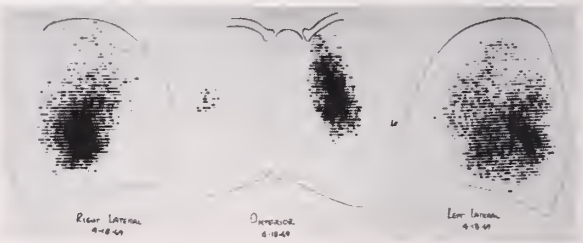

Fig. 7. Same patient as Figs. 5, 6, two (2) weeks later, no clinical improvement. Scan reveals some segmental circulation restoration (re-canalization), but perfusion deficits of both upper lobes, previously normally perfused. Patient expired one (1) week after this scan, autopsy revealed multiple bilateral pulmonary emboli, varying ages.

Discussion

Interpretation of pulmonary macroaggregate scans, without recourse to clinical information or the radiographic appearance at the time of scanning, should be limited to the appreciation of decrease or absence of regional blood flow. A more definitive diagnosis

is not warranted, regardless of the scan appearance. However, if the clinical story, routine laboratory findings, and chest x-ray appearance can be compared with the scan information, there should result a sufficiently firm provisional diagnosis to permit initiation of proper therapy.

Two major considerations prevent definitive interpretation on the basis of the scan alone. Primarily this is due to the inability of the method to separate primary perfusion deficit (arterio-capillary blockade) from secondary deficit (A-V shunting, arterio-capillary obliteration). These latter abnormalities are the results of pneumonia, atelectasis, tuberculosis, asthma, emphysema and rarer pulmonary diseases alike. Further, perfusion abnormalities also result from compression of the pulmonary artery by hilar tumor, decreased lower lobe perfusion in mitral stenosis, unilateral perfusion decrease in empyema, fibrothorax, or Swyer-James Syndrome, and localized deficits due to pleural effusion, enlarged heart (Fig. 3), or diaphragmatic splinting or paresis (Fig. 1).[7]

An additional difficulty in interpretation results from the failure to obtain lateral or posterior lung scans. The nature of the collimator on the scintillation probe is such that only the activity in the lung between the face of the collimator and 6" below it is mapped. Since an average chest is 11" in AP dimension, and each lung 7-8" in mediolateral dimension, it is obvious that complete information about each lung cannot be obtained unless anterior, posterior, and both lateral views are made. This is in direct contrast to chest radiography in which the gamma rays traverse the entire chest and information from all depths is recorded on the film. Because of the physical parameters involved, even with adequate clinical and x-ray information, interpretation of lung scans should not be done on a single view, or just one lateral and one sagittal view. Typical mis-diagnoses resulting from failure to appreciate the need for lateral scans have recently been documented by Mishkin.[4]

In most instances, however, the differential diagnosis lies between pneumonia and pulmonary embolus with infarction, as both present with chest pain, dyspnea, infiltrate on chest film, variable pulmonary function and arterial gas studies, and abnormal lung scans. (A comparison of the appearance of the lower lung fields in Figs. 2 and 4 will make the latter point quite clear). Evidence of leukocytosis tends to suggest pneumonia, and if sputum can be obtained, and is purulent, the diagnosis is further established. Pulmonary infarction, however, often results in leukocytosis, although embolization alone does not. Elevated serum LDH levels are rare in pneumonia, and embolus without infarction, but are almost always present in embolus with infarction. As recently indicated by Fred,[2] the use of pulmonary arteriography is quite reliable in differentiating between pulmonary embolus and pneumonia. However, if the patient is seen early in the course of pulmonary embolic disease, it can be distinguished from pneumonia without arteriography When the chest x-ray is normal (no parenchymal atelectasis or consolidation) and there is a defect on scan which does not occupy the apices (emphysematous blebs), the likelihood of pulmonary embolus is very high and appropriate therapy can be instituted expectantly. A prime example of this is Case 3, (Fig. 4). If diagnostic maneuvers had been delayed 24 hours, pleural fluid and consolidation might have prevented distinguishing between primary (embolic) perfusion defect and secondary (anoxic A-V shunting) perfusion defect.

The utility of the pulmonary macroaggregate scan, therefore, lies in its being done at the appropriate time, not just in its being done, and interpretation of any defects seen is unwise unless they are documented in the third dimension and are correlated with the x-ray findings and clinical story. Again the maxim, "if you think embolus, think scan" has validity because of the necessity for performing it early in the course of disease, and this is further borne out by the occurrence of 8/26 initially asymptomatic patients with pulmonary embolism in this study.

Withholding anti-coagulation or surgery in a case of pulmonary embolic disease may well result in catastrophe, yet neither are to be instituted without trepidation. Since the

pulmonary macroaggregate scan may be performed on patients unable to do more than turn over in bed, or unable to tolerate more than an intravenous injection, it has applicability to a greater patient population than the time-consuming, exhausting, and sometimes dangerous pulmonary artery catheterization and angiography. The use of serial LDH levels is very helpful for documentation of infarction, however, 24-48 hours may pass before the level rises or the test can be performed, and therapy should probably precede recognition of elevated LDH.

Summary

The value and validity of pulmonary macro-aggregate scanning was evaluated by retrospective study of the case histories, chest x-rays, laboratory data, and pulmonary scans of the first 50 patients receiving scans in a general hospital. In most instances the scan was performed for suspected pulmonary embolic disease, and in 26 of 50 patients in whom this diagnosis was established, lung scans were positive in 25, the single exception being a patient scanned over three (3) weeks after the acute episode at which time the initially abnormal laboratory and x-ray examinations had reverted to normal.

Our experience with diagnosis of pulmonary embolic disease confirms that of others in restricting the value of this method in the case of suspected acute embolism to patients whose chest x-ray has not yet become abnormal in terms of pleural fluid or consolidation, unless such changes are at a different locality than at least one of the perfusion defects on the scan.

The method is also of significant value, however, in assessing the magnitude or location of pulmonary perfusion abnormalities in patients with chronic lung disease of many types, and in cardiac disease with pulmonary involvement. 14/50 cases of this series were related to evaluations of this type.

Although the method is primarily of value because of its validity in assessing pulmonary blood flow, equally as important in its applicability to the general hospital population are the simplicity of performance, avoidance of patient discomfort, and minimum radiation dose. •

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Evaluation of metronidazole in the treatment of alcoholism*

A comprehensive three-year study comprising 60 cases

Orhan M. Sansoy, MD, Las Vegas, N.M.

Evaluation of a new drug, with successful results in eight of sixty patients. Dosage and side-effects emphasized.

Alcoholism is a complex disease which affects more than six million people in America and thus constitutes one of the most critical public health problems. Its etiology remains obscure, although in many instances, alcoholism is a facet of underlying complicated psychopathologic processes. Consequently, treatment of an alcoholic is a great challenge and usually ends in dismal failure.

Disulfuram (Antabuse) has been tried in selected cases for several years with limited success. Disulfuram is a strictly punitive drug and no suppressive effect on the desire to drink has been demonstrated.

Jo Ann Taylor[6] first reported in 1964 the therapeutic value of Metronidazole in the treatment of alcoholism. The drug, in her study, improved the hypermetabolic state of delirium tremens. Prolonged treatment decreased the compulsive drive for liquor and a combined physical and psychic aversion for alcohol developed. She also observed antabuse reaction and abdominal malaise on patients taking Metronidazole with active drinking. It was stated that only the patients with pre-existing hypothyroidism, impaired adrenergic function, or severe liver damage develop any potentially serious side effects.

Subsequent to Taylor's observation, various investigators reported optimistically on the efficacy of Metronidazole on chronic alcoholism. Most of these reports were hastily prepared and based on superficial studies on a small number of cases which were studied for a short period of time, and their evaluation solely relied on subjective investigation without determining this drug's long-term effect on various systems in the body, particularly the pathophysiology of Metronidazole-alcohol interaction.

With these points in mind, we launched our study in 1966 to determine the long-term effects of this drug. In view of the fact that these people invariably will attempt to drink while on medication, we decided to subject them to periodic alcohol tolerance tests to determine the untoward subjective, objective symptoms as well as the changes in various systems which may occur as a result of Metronidazole-alcohol interaction, i.e., cardiovascular, hepatic, renal and hemopoietic systems and electrolyte balance.

Methods and Procedure

There were sixty patients (55 males and 5 females), ages ranging from 21 to 65, treated at New Mexico State Hospital from 1966 through 1968. They all had been suffering from chronic alcoholism of long duration and had been previously treated, either at this institution or other alcohol treatment centers on numerous occasions with various drugs, including antabuse, without

*This study was supported by grant-in-aid, G. D. Searle and Co.

success. Several patients in the group had had episodes of delirium tremens in the past. Consequently, these patients represented the most intractable cases, with manifestations of physical, psychic and social deterioration.

In this study, each patient was thoroughly evaluated from physical and psychiatric points of view, which included complete physical and psychiatric examinations. Psychological tests were rendered only when schizophrenia was suspected. Each patient's entire social background was checked in detail by the Social Service Department, and their drinking habits, as well as the facts pertaining to their socioeconomic and marital status and their behavior in the society, were carefully documented.

An initial workup consisted of complete blood morphology, urinalysis, chest x-ray, electrocardiogram, liver profile, comprising bilirubin, SGOT, alkaline phosphatase, proteins and A/G), electrolyte survey (sodium, potassium and chlorides), and BUN determination. Each patient received these tests prior to administration of Metronidazole and at two weeks, four weeks and thereafter at monthly intervals up to six months, while being treated these tests being performed immediately after the alcohol tolerance test.

In our experience, to obtain the best effect, it is imperative that patients be loaded with Metronidazole, at least during the initial two weeks of therapy, and then gradually tapered to two or one tablet a day. Our usual loading dose is 250 mgm. tablet t.i.d. for the first two weeks or longer, depending on the individual response.

To determine the effects of Metronidazole-alcohol interaction, each patient underwent periodic alcohol tolerance tests, first after two weeks and the second test after four weeks of therapy. Subsequent tests were administered at monthly intervals. These tests were conducted in the medical service of New Mexico State Hospital under the close supervision of experienced personnel. Each test lasted approximately four hours. Prior to the tolerance test, the patient's blood pressure, pulse, respirations and temperature were recorded. After the administration of test dose of whiskey, wine, or beer, patient's subjective and objective symptoms were duly documented. Their vital signs were repeated every thirty minutes until the completion of the test and afterwards they were taken to the laboratory for the aforementioned battery of tests.

Duration of Treatment and Results

One Month: Twenty-four patients were treated for a period of one month. Two patients, ages 33 and 54, were given Metronidazole for acute alcoholism; initially 500 mgm. q. 6 h.; 24 hours later, 250 mgm. q. 6 h. Both responded to Metronidazole dramatically and detoxification was accomplished in less than 24 hours. The dose was reduced to 250 mgm. t.i.d. after 48 hours and kept in this range for two weeks. It was then cut to 250 mgm. b.i.d. One patient (FG—age 33) had not developed aversion and his desire to drink was not suppressed while on medication. The other patient (LG—age 54) developed partial aversion initially, but after two weeks, this disappeared and his desire to drink remained unchanged.

Twenty-two patients of the group were treated for chronic alcoholism. Twelve patients developed no aversion or intolerance to alcohol. Their desire to drink had not changed and craving persisted. The majority of these patients experienced no untoward symptoms during the alcohol tolerance test. Only two patients experienced mild disulfuram reaction, i.e., flushing, headaches and epigastric burning, mild nausea and generalized numbness and diaphoresis.

Eight patients in this group developed only partial aversion and their desire to drink was diminished, but still persisted.

Only two patients out of the twenty-four developed marked aversion to alcohol to the degree that even the sight and smell of alcohol caused severe nausea and retching. These patients stated that they absolutely had no urge to drink and both felt more relaxed and calmer while they were on medication.

All of these patients were taken into the project for a six-month period but since they had not returned for alcohol tolerance test after their last test, they were dropped from the project.

Two Months: A total of thirteen patients were treated for a period of two months. Of these, one (WL-age 49) was given Metronidazole, 2 grams in four divided doses, for acute alcohol intoxication and dosage was cut to 250 mgm. t.i.d. because of accomplishment of rapid amelioration and full recovery within twenty-four hours. This patient, developing aversion in a short period of time, took one ounce of whiskey with extreme reluctance which produced immediate vomiting during the first tolerance test. Subsequent tolerance tests revealed gradual disappearance of the aversion and he was able to tolerate the test dose of whiskey without any undesirable side effects.

In this group, four patients have developed absolutely no intolerance to alcohol nor had they felt any suppression in their desire to drink. Their craving had persisted throughout the project. Partial aversion and diminished desire to drink were observed in four patients. These patients stated that during the first month of treatment they simply had no desire for drinking, but the second month, their craving had gradually increased and they resumed drinking, but in lesser quantity.

Complete aversion was achieved in four patients. In three patients, their aversion had not changed in two months. Only one patient lost his intolerance to alcohol during the latter part of the treatment. All four patients absolutely lost their craving for alcohol and abstained from drinking

when they were back in their community. They were proud of the fact that while being among their old drinking cronies they felt no urge to join them. They were better motivated and sure of themselves and no longer felt nervous and were able to sleep well. Their appetite and well-being increased.

Three Months: There were twelve patients in this group. Seven patients out of the twelve developed no aversion or reduced tolerance to alcohol while on Metronidazole. Their craving and desire for drink persisted. These patients kept on drinking while on the project. During the alcohol tolerance test, they had experienced no untoward effects. One patient stated that during a drinking spree after the two and a half months on Flagyl, he developed severe nausea, dizziness and weakness, but despite these symptoms, he kept drinking. Five patients out of the twelve had definitely lost their craving for alcohol and developed moderate intolerance to alcohol initially, lasting approximately four weeks. One patient was out of medication for two weeks in the third month of treatment when he started drinking excessively and experienced no side effects whatsoever.

Four Months: Seven patients were treated for a period of four months. Four out of seven experienced no tolerance change or aversion. Their desire and craving for alcohol remained essentially unchanged. All four patients admitted to indulging in alcohol while they were on medication.

Two patients noted diminished desire while on Metronidazole. They never experienced excessive craving during the period of treatment. Although they claimed total abstinence from drinking, nevertheless this could not be substantiated by us. Only one patient in this group developed actual aversion to alcohol. Alcohol tolerance test could not be given to him due to severe nausea and retching he developed at the sight of whiskey. He had not indulged in drinking during the four-month period of treatment.

Five Months: Three patients received Metronidazole up to five months. One experienced no diminished desire or change in craving while on medication, but developed some intolerance to alcohol which subsequently disappeared. Another patient in this group developed aversion to alcohol after two months. He also noted marked suppression in his desire to drink. His aversion to alcohol disappeared completely after the third month of therapy. He began drinking again excessively and experienced no undesirable side effects. Only one patient developed true aversion and completely lost his desire for drinking during the entire five months of treatment with Metronidazole. His aversion was somewhat diminished after the fourth month but he remained dry and experienced no craving at all.

Six Months: Only one patient was treated for a period of six months, whose desire and craving for alcohol had not been affected by Metronidazole. During the alcohol tolerance tests no apparent intolerance to alcohol was demonstrated.

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Discussion

In our study of 60 alcoholics who were treated with Metronidazole (FLAGYL) from a period of one month to six months, 31 patients (approximately 52 per cent) experienced absolutely no beneficial effect from this drug. These patients developed no physical or psychic aversion for alcohol, and desire and craving persisted throughout the treatment period. After they had returned to the community, their alcohol consumption remained essentially unchanged. The majority of them displayed no intolerance and only mild disulfuram-like reactions were observed during the alcohol tolerance tests. Almost all of them admitted to indulging in alcohol, while on medication, without experiencing any untoward symptoms or distaste.

Partial aversion and diminished desire for alcohol were demonstrated in 21 (35 per cent) patients. Suppression of desire and decreased tolerance usually start in 7 to 14 days after the initiation of therapy. Most of these patients gradually developed refractoriness to Flagyl after the second month and their craving returned, and they no longer experienced intolerance to alcohol.

True aversion and loss of desire for alcohol were accomplished in eight (13 per cent) patients only. Two patients in this group had lost their aversion toward the latter part of therapy, but all of them remained dry during the tenure of treatment.

The most important aspect of Flagyl therapy, for that matter of any kind of therapy for alcoholism, rests entirely on the

patient's desire to cooperate. We believe it is of the utmost importance that the patient takes his medicine regularly after he has been discharged from the institution. To insure this, a helping person, most preferably non-relative, should be designated to be responsible to give the medicine to the patient daily. Needless to say, it is important to set up a community program, utilizing all the resources available in the community so as to give these patients frequent checkups and insure continuity of their therapy.

Most of our patients in the successfully treated group developed craving for alcohol after they had stopped taking Flagyl for more than five days. Some patients deliberately stopped taking it; some ran out of medicine and subsequently their desire gradually returned.

Side effects over a period of six months' observation have been relatively minimal, comprising metallic taste in the mouth, coated tongue, nausea, flatulence, diarrhea, headaches and change in libido and pollakiuria. Most of these were amenable to dose reduction and either eventually disappeared or diminished, therefore, discontinuance of medication was not necessary.

Metronidazole-alcohol interaction produced disulfuram-like reactions in varying degrees in the majority of patients. These included flushing of the face and upper part of the chest, diaphoresis, generalized tingling sensation and numbness, headaches, substernal and epigastric burning sensation, nausea, retching and vomiting. Only three patients developed tachycardia and systolic pressure drop of 30-40 mm. Hg. All of these returned to initial level within four hours. We also have found that mild to moderate disulfuram reactions were proportional to the amount of alcohol ingested. It has been postulated that Metronidazole-alcohol interaction results in the inhibition of enzyme alcohol dehydrogenase so that alcohol oxidation stops at the acetaldehyde level without progressing into aldehyde and acetic acid, thus acetaldehyde accumulation takes place and produces above mentioned symptoms.

Metronidazole also has antidepressant-like properties and in those successfully treated cases, it produced euphoria, cessation of insomnia, improved appetite and feeling of well-being. Itil et al[1] postulated that Metronidazole acts upon the central regulatory and integrating structures, possibly in the reticular formation of the brain stem.

Metronidazole is a relatively safe drug for long-term administration. Only one patient developed mild leukopenia; his initial WBC was 7,800 and after two weeks of therapy, dropped to 4,000, differential being normal. No change in the hemoglobin or hematocrit determinations was noted. Elevation of bilirubin was observed in three patients and one of them had elevated SGOT. In other patients the liver profile remained within normal limits during the treatment period. We have found no change in electrolytes, BUN or urinalysis.

Our evaluation of Metronidazole in alcoholism revealed electrocardiographic changes in approximately 30 per cent of cases, being, in order of diminishing frequency, sinus arrhythmia, sinus bradycardia (below 60), T and ST-changes, wandering pacemaker and premature ventricular contractions. Inasmuch as electrocardiograms were done usually following the alcohol tolerance test, we are postulating that these changes might be due to alcohol-Metronidazole interaction, rather than to Metronidazole per se. These changes were reversible and disappeared in three to four months in most instances. We have also noted definite suppressive effect on the tachycardia of alcoholism which was present prior to treatment.

Summary

An evaluation of Metronidazole (FLAGYL) in the treatment of alcoholism was rendered on 60 cases in a three-year study. Thirty-one patients out of 60 had no beneficial effect from this drug. Twenty-one patients developed partial aversion and their desire was diminished during the therapy, but they continued to drink although in lesser quantity. The successfully treated group included only eight patients with true aversion and lack of desire for alcohol. Patients who initially developed partial or complete aversion with diminished desire for alcohol

gradually developed refractoriness to Flagyl after the second month, and their intolerance gradually disappeared.

In order to facilitate the therapeutic effect of Metronidazole, we recommend that patients be loaded at least during the initial two weeks of therapy. The usual loading dose is 250 mgm. t.i.d. for the first two weeks or longer, then gradually tapered off to two or one tablet a day, depending on the individual response. Doses up to 500 mgm. every six hours were used for the treatment of acute intoxication for as long as 48 hours, with rapid amelioration and complete detoxification.

Metronidazole is a relatively non-toxic drug for long term administration in chronic alcoholics. In view of the fact that a rather high per cent (30 per cent) of our patients developed abnormal EKG changes comprising sinus arrhythmia, sinus bradycardia, ST-T changes, wandering pacemaker and premature ventricular contractions, we advocate periodic electrocardiograms for patients in the middle age or elderly group.

Most of our patients developed mild to moderate antabuse-like reactions manifested by flushing of the face, diaphoresis, generalized tingling sensation and numbness and abdominal malaise during the alcohol tolerance tests. •

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A medical potpourri

Compiled by Andrew M. Babey, MD, Las Cruces, New Mexico

1. "As I listen to people talking these days, and talking really seriously, I am struck by the desperate assumptions and perceptions of life which seem to be current. Civilization (we are told) is doomed, religion is an old wives' tale, science has put an end to the old order of values, and culture is disintegrated. The fear bred by the Promethean secret of the atom bomb somehow has led us to dismiss the past, dread the future, and live perilously in the present. The significant thing is not that such thoughts and ideas are spoken, but that they have become almost cliches and taken for granted. The great business of our day surely is to restore the mind, the will, and the imagination of all thinking men and women, to re-examine the order of things and to build a synthesis that will assure us even a small legitimate existence and a measure of peace of mind." SCARLETT, Earle P., *Of Physic and Metaphysics*, Archives of Internal Medcne, April 1969, Vol. 123, No. 4, p. 462.

2. "A handful of patience is worth more than a bushel of brains." Dutch Proverb, "Thoughts . . . on the Business of Life," Forbes, April 1, 1969, p. 78.

3. "The fundamental principle of human action . . . is that men seek to gratify their desires with the least exertion." Henry George, "Thoughts . . . on the Business of Life," Forbes, April 1, 1969, p. 78.

4. "If Harvard is the 'Munich' of American education, Cornell is its 'Pearl Harbor,'

Of course, what I'm saying is not true for all members of the faculty. I must confess, however, to intense disappointment with my colleagues, since I believe in the principle of faculty control. I had hoped that faculties would have more gumption and guts than they have displayed in many institutions, and especially at Harvard and Cornell.

At the turn of the century, there was an English lecturer who, having visited the American universities, returned to England with the observation that there were three sexes in America: men, women and college professors. He obviously meant to call attention to the absence of simple moral courage on the part of the faculties.

I had assumed that this failing—if it ever existed—had been overcome. Alas, there is heart-sickening evidence that many faculties are more interested in buying peace at any price than in defending academic freedom.

The great irony is that American faculties often condemned German faculties that refused to stand up to those who trampled on academic freedom when resistance might have meant the loss of their lives and those of their families. But, in the United States — confronted with a threat that doesn't begin to compare in seriousness with the threat of totalitarians—faculty members have yielded in the hope that, if they gave the students what they demanded, the students would be 'reasonable.' They only get kicked harder." Sidney Hook, professor of Philosophy and former department head at New York University, *The Real Crisis on the Campus*, U. S. News & World Report, May 19, 1969, p. 42.

5. "Almost all patients with an anemia of more than 24 hours' duration have an expanded total blood volume, and packed red cells must be considered the treatment of choice for them. In fact, practically the only patients who require whole blood are those who have had acute hemorrhages . . . If all physicians ordered packed red cells for patients who do not need the plasma, 40,000 to 50,000 units of plasma would be made available to those who desperately need plasma or its fractionation products." *Importance of Blood Components for Transfusion*, Editorials, New England Journal of Medicine, December 16, 1965, p. 1391.

6. "There must always be a struggle between a father and a son, while one aims at power and the other at independence." JOHNSON, Samuel, Quoted in 'Thoughts on the Business of Life,' Forbes Magazine, 7/15/66, p. 70.

7. "Success is the necessary misfortune of life, but it is only to the very unfortunate that it comes early." TROLLOPE, Anthony, Ibid., p. 70.

8. "Face up to the realization that here are no solutions for certain situations." VREELAND, Diana, Ibid., p. 70.

9. "The curse of religions is their tendency to make people believe that certain systems of doctrine and certain ceremonies contain in themselves the whole secret of the universe, thus reducing the vast and wonderful to the small and childish. Unfortunately, when human nature functions without religion it makes exactly the same mistake. The blight of modern psychology is its tendency to think that when names are fixed to various aspects of human behavior, a great advance towards wiser conduct is thereby made. Similarly, the arrogance of priesthood is today found all too frequently among scientists and notably psychiatrists. . . . The nature of the universe and of man is in hard fact infinitely complex, and ultimately mysterious. . . . It makes ridiculous those who pretend to know all the answers, whether they do so in the name of God or of science." Editorial, The Observer, Jan. 16, 1955, p. 6.

10. ". . . 'To me,' wrote the late Dr. Claude M. Fuess of Phillips Andover Academy, 'education is the process of so broadening and intensifying a person's latent, intellectual, artistic and moral power as to enable him to develop his capacity for enjoyment, to increase his efficiency and his esthetic and spiritual resources'." Quoted from "A Patriotism for All Seasons," PEARSON, Dr. Roy, Saturday Review, 8/19/67, p. 17.

11. ". . . No man and no party has any messianic mission, and the chance of defeat is a normal risk of the politician's trade. As a matter of fact the risk of being straightforward is certainly no greater, and may be less, than that of waiting and calculating. For popularity arising from catering to popular whims is like walking a tightrope; it can be done for a while, but a man cannot go far that way. The enduring popularity of public men does not come from trying to guess what the people will applaud but from conveying to them the feeling that they can rely on the superior judgment of that man when they need him. It is no comfort whatever to know that he is a good judge of public opinion; they will really trust him only if they have some evidence that he is a good judge of the public interest." Quoted from "The Essential LIPPMANN," Edited by ROSSITER, C. and LARE, J, Vintage Books, 1965, p. 476.

12. ". . . Long experience has taught me how rare it is in public men to accept public criticism without private resentment, which only too often spreads to their wives and their sisters and their brothers and their aunts. To be free of that kind of resentment is the mark of a thoroughbred, and the Dulles family are thoroughbreds, born to and trained to the demands of public life. They really do their public duty as they see it, without letting their private feelings take hold of them." Ibid., p. 481.

13. ". . . Thus one of the indubitable causes of the ruin of France was the savagery with which the politicians attacked one another and intrigued against one another. Not only did the fury of their partisanship render impossible a coherent and effective policy; the manner in which public men assassinated the honor of public men bred a cynicism and contemptuous indifference which devitalized the people." Ibid., p. 490.

14. ". . . It is more than ever necessary in these days that a candidate for the highest office should convince the nation that they are in the presence of someone who is able to lead them, not merely to wait for the Gallup poll and follow. There is bewilderment; the people would like a President who is lucid. There is great anxiety; the people would like a President who is resolute and imperturbable. There is suspicion and division; the people would like a President who is boldly magnanimous and chivalrous. There is vast disorder in human affairs and there are tremendous tasks to be done; the people would like a President who will organize their energies and, thereby, give them that courage and confidence which can be reached these days only as men, ceasing to brood and worry impotently, are put to work doing efficiently some hard job they believe it is necessary to do." Ibid., p. 491.

15. ". . . I do suggest that one of the great dangers which besets any ruler of men is the tendency to find himself surrounded entirely by men who have not the wish to disagree with him or the courage to speak their minds. The power of the chief of a state is so immense and so dazzling that for fear of incurring his disfavor or in anticipation of favors to come, the men around him are disposed to say yes as often as possible, to say no infrequently and with insufficient emphasis. The wise ruler will always seek to protect the independence of his own colleagues; for statesmen are more often ruined by their subservient friends than by their avowed opponents." Ibid., p. 496.

16. ". . . What has happened in France illustrates a truth which I first came upon years ago in a history of the French Revolution. It is that a regime, an established order, is rarely overthrown by a revolutionary movement; usually a regime collapses of its own weakness and corruption, and then a revolutionary movement enters among the ruins and takes over the powers that have become vacant." Ibid., p. 503.

17. . . . For when men age, they may grow vain, irascible, and self-centered. Or they may grow wise, benign, compassionate, and universal. Churchill has aged well. At the pinnacle of his fame, we saw him the other day treating the humblest man asking the most impertinent question with that courtesy which only those display who really respect the dignity of other men. He does not talk down to other men, nor does he talk over them. He talks to them because they have a right to know. Thus he rallies men to his standard because he engages that which is noble in them. And even in his wrath aganist the enemy, which is awe-inspiring, there is not the malice of the small man but the chivalry of the good warrior." Ibid., p. 505.

18. ". . . Potassium deficiency is the most frequent complication of diuresis. An approximation of the potassium loss from diuretics is reached by estimating that 60 mEq of potassium is lost with each pound of fluid removed." HARRISON, T. R. et al., Principles of Internal Medicine, Fifth Edition, 1966, McGraw-Hill Book Co., Inc., N. Y., p. 1063.

19. ". . . Most patients with liver disease are depleted of 100 or 200 mEq potassium, thus large supplementation is usually needed." Ibid., p. 1063.

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Precautions: As with other thyroid preparations, an overdosage may cause diarrhea or cramps, nervousness, tremors, tachycardia, vomiting and continued weight loss. These effects may begin after four or five days or may not become apparent for one to three weeks. Patients receiving the drug should be observed closely for signs of thyrotoxicosis. If indications of overdosage appear, discontinue medication for 2-6 days, then resume at a lower dosage level. In patients with diabetes mellitus, careful observations should be made for changes in insulin or other antidiabetic drug dosage requirements. If hypothyroidism is accompanied by adrenal insufficiency, as Addison's Disease (chronic subcortical insufficiency), Simmonds's Disease (panhypopituitarism) or Cushing's syndrome (hyperadrenalism), these dysfunctions must be corrected prior to and during SYNTHROID (sodium levothyroxine) administration. The drug should be administered with caution to patients with cardiovascular disease; development of chest pains or other aggravations of cardiovascular disease requires a reduction in dosage.

Contraindications: Thyrotoxicosis, acute myocardial infarction.

Side effects: The effects of SYNTHROID (sodium levothyroxine) therapy are slow in being manifested. Side effects, when they do occur, are secondary to increased rates of body metabolism: sweating, heart palpitations with or without pain, leg cramps, and weight loss. Diarrhea, vomiting, and nervousness have also been observed. Myxedematous patients with heart disease have died from abrupt increases in dosage of thyroid drugs. Careful observation of the patient during the beginning of any thyroid therapy will alert the physician to any untoward effects.

In most cases with side effects, a reduction in dosage followed by a more gradual adjustment upward will result in a more accurate indication of the patient's dosage requirements without the appearance of side effects.

Dosage and Administration: The activity of a 0.1 mg. SYNTHROID (sodium levothyroxine) TABLET is equivalent to approximately one grain thyroid, U.S.P. Administer SYNTHROID tablets as a single daily dose, preferably after breakfast. In hypothyroidism without myxedema, the usual initial adult dose is 0.1 mg. daily, and may be increased by 0.1 mg. every 30 days until proper metabolic balance is attained. Clinical evaluation should be made monthly and PBI measurements about every 90 days. Final maintenance dosage will usually range from 0.2-0.4 mg. daily. In adult myxedema, starting dose should be 0.025 mg. daily. The dose may be increased to 0.05 mg. after two weeks and to 0.1 mg. at the end of a second two weeks. The daily dose may be further increased at two-month intervals by 0.1 mg. until the optimum maintenance dose is reached (0.1-1.0 mg. daily).

Supplied: Tablets: 0.025 mg., 0.05 mg., 0.1 mg., 0.15 mg., 0.2 mg., 0.3 mg., 0.5 mg., scored and color-coded, in bottles of 100 and 500. Injection: 500 mcg. lyophilized active ingredient and 10 mg. of Mannitol, N.F., in 10 ml. single-dose vial, with 5 ml. vial of Sodium Chloride Injection, U.S.P., as a diluent.

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Fog on the Embankment. Two figures emerge into silhouette against a ialoed street lamp. The flare of a match reveals the profile of Sherlock Holmes. As he lights his calabash, his companion speaks:

"By Jove, Holmes, that amazing intuition of yours has proved right again. What we're looking for is a single entity. I thought we were dealing with several others—even twins. But now—I'd say we've uncovered a double agent."

'Tell me more, Watson, and be quick about it!"

Watson withdraws a folded paper from inside his greatcoat, and reads aloud from it):

"The key to the whole cypher is SYNTHROID (sodium levothyroxine)"...

"Shhh! Watson, not so loud! You'll alert our quarry."

(Watson continues): "A single entity that serves two functions."

"A master stroke, Watson."

"Follow along, Holmes. In the neighborhood of 95% of the circulating thyroid hormone is levothyroxine—T_4 as you call it. T_4 is bound to thyroxine-binding proteins in the serum. It becomes available only gradually to tissue cells—as free thyroxine."

"Is that why there's such a smooth, predictable response, Watson?"

"Quite! With agent T_4, SYNTHROID, the chances of a precipitous rise in metabolic rate are lessened."

"But how does 'free' thyroxine fit into the picture?"

"Well, Holmes, you might call it the tissue thyroid hormone—because 'free' thyroxine (that is, thyroxine not bound to protein) is active at the tissue level. It is gradually released from thyroxine-binding proteins. Each daily dose of SYNTHROID is mostly bound to thyroid-binding proteins, and slowly released as 'free' thyroxine—the form in which it is metabolically active."

"Magnificent, Watson! So protein-bound thyroxine is the major form of circulating thyroid hormone, and it is released as 'free' thyroxine. And that's why, SYNTHROID is able to simulate the normal process so artfully. Q.E.D."

"Not so fast, Holmes. SYNTHROID works for the *physician*, too. Because its dosage is more precisely controllable, and because response is so smooth and predictable, the *doctor* gets fewer phone calls in the wee hours from agitated patients. Both parties get more sleep!"

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Constrictive pericarditis*

PRESENTED BY: Dan Hottenstein, MD, Resident in Medicine
DISCUSSED BY: John K. Leach, MD, Assistant Professor, Department of Medicine
William R. Blakely, MD, Assistant Professor, Department of Surgery

Dr. Hottenstein: A 36-year-old man was admitted to the Veterans Hospital for the first time because of periodic swelling of the hands, feet, and face and recurrent painful urination for five months.

Eighteen months before admission he was admitted to another hospital with the sudden onset of chest pain, dizziness, and fever. He also noted shortness of breath and numbness in his hands. A chest x-ray was said to show bilateral basilar patchy infiltrations, and the patient was told that an electrocardiogram was abnormal. His symptoms gradually subsided on antibiotic therapy. Two weeks later he was treated in another hospital with Azo-gantrisin for epididymitis. He was then well until ten months before admission when he began to suffer from dysuria with cloudy urine, progressive shortness of breath and fatigue. Five months before admission the swelling of his feet, legs, hands, and face recurred. He was again hospitalized and a chest x-ray, intravenous pyelogram and right retrograde pyelogram were normal. Urinalysis and a urine culture were also negative. His white blood count was 10,000/mm^3 at that time and other laboratory studies were unrevealing. A diagnosis of recurrent pyelonephritis was made.

After discharge and in spite of treatment with antibiotics, diuretics, and vitamins, he continued to be weak, with edema, muscle cramps and persistent dysuria.

*Prepared by William S. Curran, MD, Assistant Scientific Editor for New Mexico. Albuquerque, New Mexico.

The patient smoked about one pack of cigarettes daily, and drank alcohol occasionally. While in the service he was told he had an ulcer, but he had had no gastrointestinal symptoms since discharge. Family history was unremarkable except for possible rheumatic fever in a brother.

On physical examination he appeared well. Blood pressure, sitting, was 124/90 in the right arm and 116/88 in the left arm. The left external jugular vein was distended to the angle of the jaw in the vertical position. There was no paradoxical pulse or Kussmaul sign. Both lungs were clear. The heart was normal size; an S-3 gallop sound was present at the apex; there were no murmurs. The abdomen was unremarkable; there was no hepatomegaly or ascites. No peripheral edema was present.

Laboratory studies showed the urine to have a specific gravity of 1.022 and a trace of albumin, but was otherwise normal. BUN was 16 mg%; creatinine 1.3 mg%; sodium 143, K 4.8; CO_2 24; Cl 109; Ca 5; PO_4 2.5 (mEq/L). Routine urine culture was negative. Serum protein was 6.6 gm % with albumin of 4.4 gm%. Several LE preparations were negative. Alkaline phosphatase was 48 Babson-International units. Creatinine clearance was 53 ml per minute. Chest x-ray (Fig. 1) and cardiac fluoroscopy were interpreted as normal except for basilar pleural thickening on right. Electrocardiogram showed right axis deviation, and inverted T waves in I, II, III, aVF, V_2 V_6. (Fig. 2) A liver biopsy showed minimal portal fibrosis.

Pericardectomy was performed on February 4, 1969. His post-operative course was complicated by jaundice of unknown cause, which cleared. Cardiac catheterization data will be discussed by Dr. Leach.

Dr. Leach: As is now plain, today's patient had constrictive pericarditis. This diagnosis was suspected from the first although there are some other conditions producing a similar pattern which we shall discuss. By definition, constrictive pericarditis is chronic pericardial thickening with or without calcification which interferes with ventricular filling. Probably most of the signs, symptoms, and complications of the disease can be related to the impairment of filling and resultant restriction of cardiac output.

Constrictive pericarditis was first described in 1669 by Lower when he observed a young housewife with a very small pulse pressure who at autopsy was found to have a thickened, opaque pericardium. Lancisi in 1719 and Concato in 1881 made further contributions to our understanding of the disease. In 1895 Weill recognized the relationship of the previously described thickening of the pericardium to the small pulse, venous distension, and edema and said "one day it will come within the province of surgery to deliver the heart from the shell which strangles it." In this country the first operation to relieve constrictive pericarditis was done by Churchill in 1928. It had been done about 15 years earlier in Germany by Sauerbruch. In a famous lecture in London in 1935, Paul White for the first time tied together all the signs,

Fig. 1. Chest x-ray normal except for basilar pleural thickening on right.

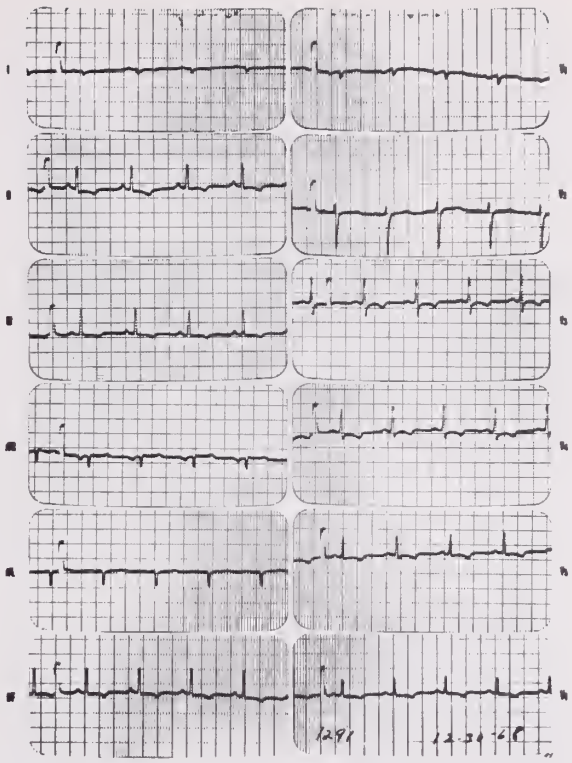

Fig. 2. Electrocardiogram shows right axis deviation, inverted T waves in I, II, III, aVF, V_2 V_6.

symptoms, and pathology as we know them today.[1]

We really don't know what caused the constriction of our patient's pericardium. As you are well aware, not too long ago it was felt that most cases of constrictive pericarditis were tuberculous. As recently as 1961 Paul Wood, the late famous London cardiologist, made this statement.[2] One still hears recommendations, therefore, that patients should have antituberculous chemotherapy before and after surgery. In the past six years things have certainly changed. Current opinion favors causes other than tuberculosis as more common. Particularly, viruses such as Coxsackie B have been implicated.[3] These agents produce so-called nonspecific pericarditis, and it is evident that this can become constrictive. In addition, on occasion we see constriction after Staphylococcal, pneumococcal and certain fungal pericarditis. A few instances of constrictive pericarditis have been described following infectious mononucleosis. Finally, and much more rarely, infiltration by neoplasm, radiation fibrosis, Gaucher's disease, trauma, and uremia can be associated with pericardial constriction. Dr. White emphasized,[1] and Paul Wood re-emphasized,[2] that rheumatic fever never causes constrictive pericarditis.

As for today's patient, he stated that he had pneumonia in July, 1967. At that time his attending physician also was worried about a heart attack, and the combination of these two clinical

features does suggest non-specific or viral pericarditis, as there is frequently some pleural irritation and even pneumonitis associated with such illnesses. His tuberculin test was negative, although he also had a negative reaction to mumps which suggests he might be anergic. Nevertheless, he has had no clinical or laboratory evidence of tuberculosis.

Within six months of the July 1967 episode he began to develop signs of progressive pericardial constriction. Pathologic study of such cases shows that both the visceral and parietal pericardium are involved. As is well known, long-standing cases may have pericardial calcification. It has been said that calcification is most frequent with tuberculous pericarditis, but it may be that calcification depends mainly on the duration of the disease. When constriction from any cause has been present for several years, calcification is found in up to 60 per cent of patients,[2,4,5] and in more advanced cases may also involve the myocardium.

The symptoms and signs of constrictive pericarditis are mainly related to venous engorgement and inadequate cardiac output. One can explain the patient's symptoms of exertional dyspnea, recurrent abdominal swelling, and edema of the extremities on this basis. This is a mechanical concept, and if true, early surgery should give a good result. The fact that this patient and others have shortness of breath and fatigue as well as the other symptoms noted, reminds us that this disease also restricts left ventricular filling and cardiac output. Although patients with constrictive pericarditis rarely get real pulmonary edema, it is common to have restricted left ventricular filling with elevation of pressure in the pulmonary veins and capillaries. The reason they do not get pulmonary edema is, I suppose, the high diastolic pressures on the right side which impairs filling of the right ventricle enough to keep pressure in the pulmonary capillaries below edema levels. Orthopnea is commonly explained on the basis of chronic elevation of pulmonary venous and capillary pressure. Abdominal swelling is a well-known early sign of constrictive pericarditis. Some of the patients described in the literature have had abdominal swelling with ascites before, and out of proportion to, edema of the lower extremities. So, if you are faced with recurrent ascites without edema, think of constrictive pericarditis. According to Wood[2] many of these patients have recurrent or intermittent liver enlargement as the major cause of their abdominal swelling. However, cases have been cited with edema but no abdominal swelling. So, although ascites is occasionally the most prominent sign, it does not have to be. The most typical history is very slowly developing chronic intermittent exertional dyspnea, perhaps orthopnea, recurrent edema, and recurrent swelling of the abdomen; in short, a patient with chronic refractory congestive heart failure. Such patients have frequently been followed for many years before the diagnosis of pericardial constriction is made.

As for the other typical physical findings such as small pulse pressure, small arterial pulse and paradoxical pulse, these are very helpful when present. We were not able to detect a paradoxical pulse in today's patient, and in various series this sign is present in 15 to 60 per cent of cases.[2,5,6] This may be due to the fact that we can only make a crude measurement of paradox.

The venous pressure and pulse are extremely important. Increased venous pressure was the one sign which, more than anything else, led us to the diagnosis of this patient. In fact, one could make a dictum that without venous distention constrictive pericarditis is not present. At 90° this patient's neck veins were distended to the angle of the jaw, and were pulsating. Characteristic features of the venous pulse have been described. One is Kussmaul's sign, or paradoxical response to inspiration. As you know, normally venous pressure decreases with inspiration, but in these individuals it increases. We could not detect it in this patient, possibly because of the extreme degree of distention. Another sign is the diastolic collapse of Friedreich which was described in 1855. This is described as a sharp "Y" descent with a deep "Y" trough. This is caused by the high filling pressure falling rapidly with opening of the tricuspid valve. Then, since diastole is restricted by the thickened pericardium, there is a sudden rise in pressure followed by an over-shoot. Actually, this is also seen in congestive failure when there is severe overload and restriction of right ventricular filling.

Gibson described a sharp, deep "X" descent in some cases of constrictive pericarditis, a finding that is apparently not found in congestive failure.[7]

In the more chronic cases of constrictive pericarditis, atrial fibrillation is frequent. Atrial flutter also is seen but somewhat less frequently. The two probably occur in about 45 per cent of chronic cases.[2]

Finally, one may have a poorly defined apical impulse on palpation, and a third heart sound sometimes called a "pericardial knock" occurring just a little earlier than the normal third heart sound, or about .09 to .12 seconds after aortic valve closure. This knock is frequently confused with an opening snap of mitral stenosis; though, of course, in constrictive pericarditis one would not expect to have any murmurs. The knock is probably related to the limitation in filling caused by constriction. Frequently the second sound in these patients is widely split. Murmurs have been described in constrictive pericarditis, but are unusual. In one case report, impingement of calcium on the mitral valve produced a murmur simulating mitral stenosis. Systolic murmurs have

also been attributed to thickening of the outflow tract of either the right or left ventricle. As you will probably realize, this would generally confuse the issue.

The electrocardiogram is not of much diagnostic help in constrictive pericarditis, but certain clues are helpful. Frequently low voltage is present. The electrical axis tends to be to the right as it was in this patient. (Fig. 2) In fact, I am not aware of any cases of pure constrictive pericarditis where a left axis deviation was reported. Flattening or inversion of T waves is commonly found. Finally, P wave changes are not unusual in this disease. Frequently they are broad and notched and said to resemble the P waves of mitral stenosis.

Was the x-ray of any help? As you all know, fluoroscopy frequently shows diminished pulsation; but, as in many other patients, this finding was not present in our case. The x-ray did show straightening of the left heart border, suggesting left atrial enlargement and causing possible confusion with mitral stenosis (Fig. 1). I think this point needs more emphasis. Cornell and Rossi recently reviewed radiologic findings in 21 cases of constrictive pericarditis.[8] They found an enlarged pulmonary trunk in 90 per cent, enlarged left atrium in 76 per cent, enlarged right ventricle in 81 per cent, and enlarged left ventricle in over 50 per cent of their cases. In addition, enlargement of the right atrium and superior vena cava was frequently noted. It has been well emphasized in recent years that the heart in constrictive pericarditis is generally not small and frequently is enlarged.

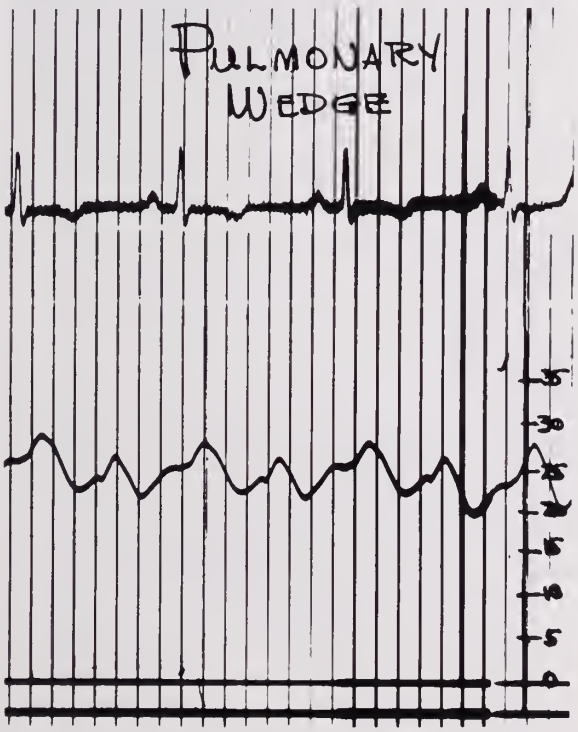

Fig. 3. Cardiac catheterization tracing.

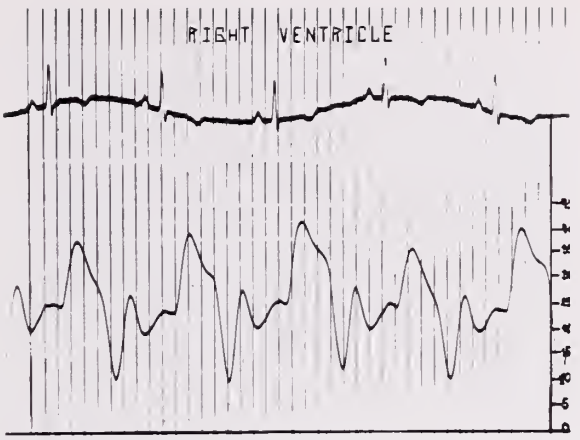

Fig. 4. Cardiac catherization tracing.

We should mention a number of other described diagnostic measures of use in patients with constrictive pericarditis. Thickening of the pericardium may be demonstrated either by angiography, or by CO_2 injection into the right atrium, to measure the thickness of the wall. The "cine-diastolic snap sign" is an interesting and recent observation.[9] Cineangiocardiography is carried out with injection of contrast medium into the right atrium, and an abrupt restriction to ventricular diastolic expansion is seen. We do not have these studies on Mr. Smith because he previously had demonstrated allergy to BSP dye and to Lidocaine and for this reason the use of contrast media was avoided.

What complications can occur in patients with constrictive pericarditis? Chronic congestion can produce centro-lobular necrosis in the liver with impairment of various liver function tests. A fascinating finding in severe constriction is marked albuminuria, probably also related to chronic venous congestion. In fact, constrictive pericarditis is one of the reversible causes of the nephrotic syndrome. Protein losing enteropathy was first described in 1960 by Jiminez-Diaz with decreased serum albumin, steatorrhea, and hypocalcemia. Intestinal biopsy of such patients shows the primary change to be dilated lymphatics, and if the constriction is corrected, reversal of these changes has been demonstrated. Finally, and more rarely, patients with constrictive pericarditis occasionally develop splenomegaly and thrombocytopenia.

To briefly summarize the cardiac catheterization data (Fig. 3-5), the pulmonary capillary pressure, or wedge pressure, as you know, is a fairly good reflection of left atrial pressure. The mean pressure on our patient was about 25 mm Hg (normal 12). The right ventricular systolic pressure was about 40 mm Hg (normal 25). The pressure tracing shows an early diastolic dip followed by a rapid rise related to abrupt restriction of ventricular expansion during diastole, and a markedly elevated end-diastolic pressure of 23 mm Hg (normal 5).

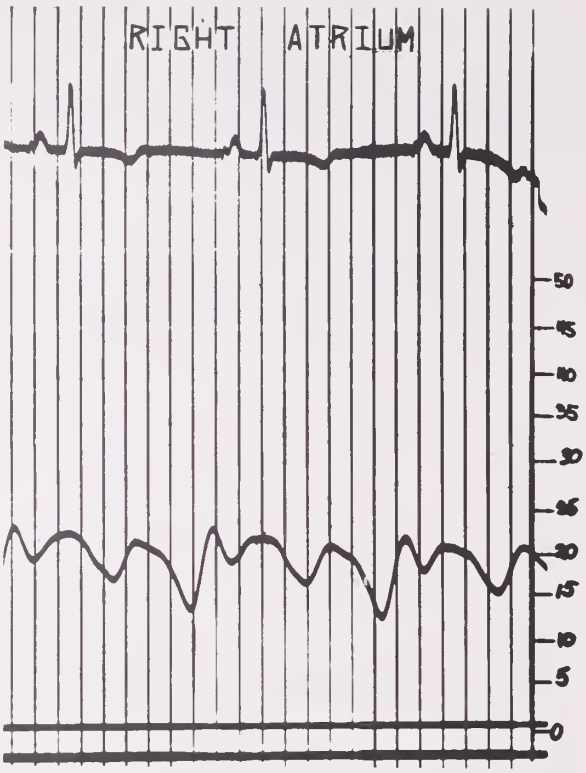

Fig. 5. Cardiac catherization tracing.

Primary myocardial disease can produce a pattern similar to pericardial constriction. One helpful point in differentiation is the relationship between right ventricular end-diastolic pressure and systolic pressure. If this ratio is greater than 33 per cent, some authors feel this is good evidence of constriction as opposed to right ventricular failure from other types of heart disease. In our patient the ratio was certainly well above 33 per cent (23/40). The atrial and wedge pressures are also sometimes of help. Normally, left atrial pressure is higher than right atrial pressure by a few mm. and this is true also in constriction. In patients with primary myocardial disease, on the other hand, left atrial pressure is usually a good deal higher than the right atrial pressure.[2] Exercise will increase this difference. However, in a number of cases the final differentiation between constriction and primary myocardial disease has been made by the surgeon, and I would now like to ask Dr. Blakeley what he found at operation.

Dr. Blakeley: The surgeon in this instance played a very small role in the management of this patient. Dr. Leach deserves credit for his aggressive approach to this problem. All we had prior to cardiac catheterization was the history, some venous distention and a straight left heart border. If it had not been for the cardiac catheterization data, I would have been reluctant to do an exploratory operation on this man; and as it was, Dr. Leach had to push me a little. However, as soon as the fat was removed from the anterior aspect of the pericardium, we could see that it was opaque in contrast to its usual almost transparent appearance. We could not see the atria and ventricles at all through this man's pericardium, which was about 2-3 mm thick and very tough. The operation is very reminiscent of peeling an orange — once the plane between parietal and visceral pericardium is achieved by slowly deepening the small initial incision, the shell peels off rapidly with a minimum of sharp dissection, leaving a small residual on the surface of the heart, particularly in the atrioventricular grooves. All the grooves and indentations on the surface of the heart were filled with the same type of membrane, much thinner, with a few small pockets of edema, suggesting the residual of some active process. There was no purulence. Subsequent microscopic examination of the pericardium showed fibrous thickening focal chronic inflammatory reaction, and focal calcification without granuloma or giant cells. This was not diagnostic of any specific etiology. The operation itself is not difficult and the thickened membrane should be removed from all the grooves, particularly atrioventricular, if technically possible. Although a successful result may be expected in a high proportion of patients, the heart apparently takes some time to recover; and we may see congestive heart failure occurring about 48 hours after the operation, as indeed occurred in this patient. It responded rapidly to fluid restriction and digitalis therapy. It may be some weeks or months before the patient is able to return to full activity.

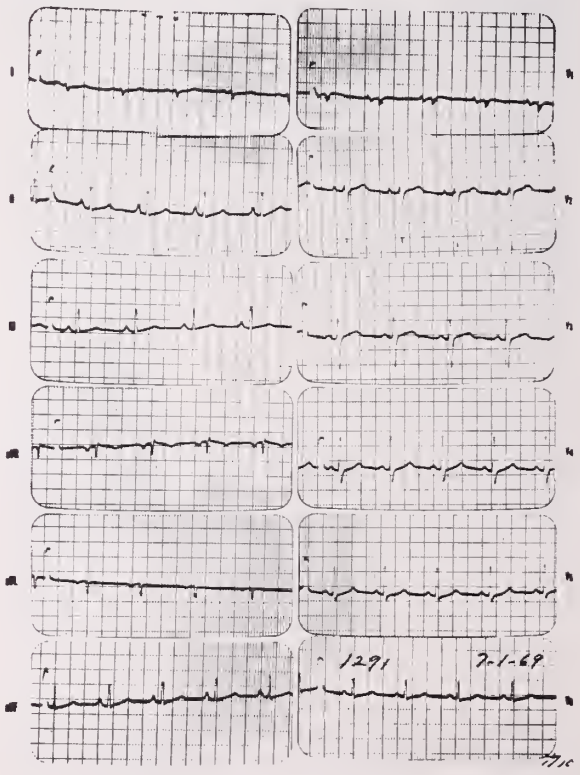

Fig. 6. Follow-up electrocardiogram, July, 1969.

Dr. Hottenstein: The patient returned for follow-up studies in July, 1969. He had returned to work as a truck driver and had experienced no recurrence of symptoms. Electrocardiogram was normal (Fig. 6) and repeat cardiac catheterization revealed normal pressures.

Question: What is the mechanism of the deep X descent described by Gibson?

Dr. Leach: The deep X descent is associated with abrupt systolic fall in right atrial pressure and has been attributed to rapid ejection of blood from within the rigid pericardium during ventricular systole, associated with marked descent of the base when the lateral walls of the ventricle have difficulty in moving inward.[2,7]

Question: Does the pericarditis associated with systemic lupus erythematosus result in constriction?

Dr. Leach: Although it has been stated that constriction does not occur following lupus pericarditis such a case has been reported.[11]

Question: What is the place of angiocardiography in the diagnosis of constrictive pericarditis?

Dr. Leach: Steinberg has recently emphasized the importance of pericardial effusion in the pathogenesis of constrictive or restrictive pericarditis and recommends angiocardiography for early diagnosis.[12] He states that elevated venous pressure and prolonged circulation time in the presence of relatively normal heart size suggest cardiac tamponade or effusive-restrictive pericarditis. If angiocardiography suggests the presence of pericardial effusion, and pericardiocentesis does not alleviate the venous hypertension, effusive-restrictive pericarditis is probably present and prompt surgery should be considered.

Question: What is the response to the Valsalva maneuver in constrictive pericarditis?

Dr. Leach: The Valsalva maneuver frequently produces a square wave response, similar to that seen in patients with congestive heart failure.

Question: Did you encounter any calcification of the pericardium during the operation?

Dr. Blakeley: Fortunately not. Calcification can make the operation much more difficult technically, inasmuch as it sometimes extends into the myocardium itself. Attempting to remove some of these "patches" may lead to entry into ventricle or atrium and troublesome hemorrhage.

Question: Was the process more extensive over the right atrium or vena cavae?

Dr. Blakeley: In this case, no. Thickening was remarkably uniform from origin of pericardium on the aorta and pulmonary artery to the diaphragm, necessitating removal of the entire anterior aspect of the pericardium from superior to inferior and back to the pulmonary veins. It is important to divide the constriction at the extreme extent of the pericardium where superior and inferior vena cavae enter, where ring-like constriction compromised these vessels. The bulging of the veins and atria when last bits of constricting bands and membranes are removed is quite obvious and most gratifying at the operating table. The process clearly involved both right and left sides of the heart equally.

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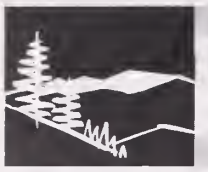

COLORADO

C-W RMP Plans Move

Offices of the Colorado-Wyoming Regional Medical Program (C-W RMP) will be moved from the University of Colorado Medical Center campus to the Franklin Medical Building, 2045 Franklin St., in Denver soon after the first of the year.

DME's to Assist with C-W RMP Continuing Education Activities

Two regional physicians, one in Colorado and one in Wyoming, have joined the Colorado-Wyoming Regional Medical Program (C-W RMP) staff on a parttime basis as area coordinators for the RMP Continuing Education Division.

Roy W. Holmes, MD, Casper internist, is serving as coordinator in Central Wyoming and Charles E. Wilson, MD, Grand Junction dermatologist, is Western Colorado coordinator.

They will assist health care professionals in their respective areas develop continuing education programs and will serve as a liason between the area practitioners and the Continuing Education Division.

Comprehensive Cardiac Care Program Under Development

An extensive cardiovascular education program for physicians in Colorado and Wyoming is under joint development by the Colorado-Wyoming Regional Medical Program (C-W RMP) and the Colorado and Wyoming Heart Associations.

Now pending at the Division of Regional Programs in Bethesda, Maryland is a grant request to establish a "Comprehensive Cardiac Care" program to be directed by cardiologist Robert C. Jones, MD, head of the C-W RMP Cardiovascular Disease Division, and controlled by a governing board of representatives of the two heart associations. Dr. Jones explained that the two associations asked for RMP assistance in expanding existing educational programs and building new ones where they do not exist. Some teaching programs under Dr. Jones' direction are already under way and others are being formulated.

Dr. Jones and C-W RMP staff cardiologist Charles H. Lesage, Jr., MD, have enlisted the support of more than 40 Colorado and Wyoming physicians as an active "faculty" to serve as teachers and consultants throughout the two states.

Dr. Jones said that many hospitals now have electronic monitoring equipment, but hospital personnel need training before any impact can be made on the high mortality of heart attacks.

Cardiology courses stressing electrocardiography, coronary care units and related topics are already being conducted by Dr. Jones and members of his faculty every other Friday in Grand Junction, Colorado. Consultation teaching clinics are under way in Grand Junction, and Durango, Colorado and Wyoming. Others are planned.

Designers of the far-reaching coronary care training program are planning in-depth courses in coronary care training for physicians, support for programs to train nurses in coronary care, one- or two-day workshops or a series of multiple one-day sessions in specific hospitals: Training in cardiopulmonary resuscitation of physicians, nurses, allied health personnel and laymen; preceptorships for physicians who desire intensive short-term training in specific aspects of heart disease in a large metropolitan hospital of their choice, electrocardiographic data phone service, advisors or speakers and audiovisual equipment for use in community hospital training programs and consultation services in the form of visiting consultation-teaching clinics.

MONTANA

Component Society Elections

At the annual meeting of the Cascade County Medical Society, Richard E. Lauritzen, MD, Great Falls, was named president to succeed John Pfaff, Jr., MD, Great Falls. Hugh V. Anderson, MD, Great Falls, was named vice-president; William R. Lee, MD, Great Falls, secretary; and F. John Allaire, MD, Great Falls, treasurer. The members of the Southeastern Montana Medical Society at its recent annual meeting named Lewis L. Bock, MD, Miles City, president, to succeed James R. Beaty, MD, Miles City. Richard E. Musser, MD, Ekalaka, was elected vice-president; and Gerald E. Rowen, MD, Miles City, secretary-treasurer.

Comprehensive Health Planning

The Montana Medical Association has strongly supported comprehensive health planning and has urged its members to assist the organization of area-wide councils for health planning. Members have participated in planning seminars. Yet, many physicians express concern that our participation in comprehensive health planning is contributing to a facade which obscures their (federal) *real* intention: federal control of medical practice. This is the *one* program which offers an opportunity for local groups to contribute to the solution of their health needs. I believe that there may be a much greater danger to medicine than participation.

My concern: We make a sincere and determined effort to remedy "health" by improving health services, but find that this is only a small portion of factors affecting "health." It will not have the major impact we, and others, had expected. As it is recognized that we are not "doing the job," once again we will be blamed for its failure. . . . Now is the time to emphasize that "environment" plays a major role and also acts as an unbelievably large drain upon "health." . . . We cannot solve all "health" problems, and we should make that clear at the onset. Others, individuals and agencies, etc., have this major job.—Colvin H. Agnew, MD

Medical Mission

Robert W. Thometz, MD, Butte, spent the month of December as a medical missionary deep in the rugged mountains in the interior of the Republic of Guatemala. Doctor Thometz taught the basic principles of eye, ear, nose, and throat diagnosis and some techniques of treatment at this Catholic mission.

M.P.S. Election

The Board of Trustees of Montana Physician' Service at its annual meeting early in December named John A. Layne, MD, Great Falls, as president. Doctor Layne succeeds William F. Antonioli, MD, Butte. E. E. Bertagnolli, MD, Three Forks, was elected a vice-president of M.P.S. James J. McCabe, MD, Helena, was re-elected secretary; and Everett H. Lindstrom, MD, Helena, assistant secretary.

MEDICAL SCHOOL NOTES

University of Colorado Medical Center

A sixth unrestricted grant of $5,000 to the Division of Ophthalmology of the University of Colorado School of Medicine has been announced by Research to Prevent Blindness Inc. of New York City, sponsors of a continuing national campaign against eye diseases. The award is designed to provide "maximum freedom for the pursuit of new concepts in eye research." Annual grants now totaling $30,000 have been made by RPB to the CU ophthalmology division since 1964, offering fluid financial aid to a wide range of new and supportive research activities aimed at the eradication of blinding diseases.

Dr. Ellis, professor and head of the Division of Ophthalmology, said the 1970 grant from RPB will be used, as needed, to inaugurate pilot projects and studies and to "follow up interesting leads as they develop." Portions of the grant, he said, probably will be used in support of a continuing study at the CU Medical Center of the movement of local and systemic drugs into the eye, and of investigations of the changes in metabolism of the eye which leads to cataract formation.

* * * * *

University of New Mexico School of Medicine

Dr. Hugh B. Woodward, a member of the New Mexico State Board of Health, was re-elected chairman of the advisory group of the New Mexico Regional Medical program—a federally-funded program whose "medical fingers" are now bringing improved health care to areas throughout the state. Dr. Vaun T. Floyd, president of the New Mexico Heart Association, was elected vice chairman. Director of the New Mexico Regional Program (RMP) is Dr. Reginald Fitz.

Among the many RMP projects now under way in New Mexico is the Tumor Registry, which reports to 31 hospitals and almost 500 doctors in New Mexico and Arizona.

Stroke patients in New Mexico are benefiting from visits of the RMP stroke rehabilitation team. A team of six RMP specialists presented a two-day conference on cerebrovascular accidents in Roswell and is planning another conference in Raton in February. The stroke team has been working closely with hospitals in Albuquerque, Carlsbad, and Roswell who are developing the team concept of rehabilitative care of stroke patients.

The New Mexico RMP is now in its second year of operational activities, with more than $1.6 million being used for heart, cancer, stroke and emergency medical care projects in the state.

* * * * *

Robert S. Stone, MD, Appointed V-P for Health Sciences

Expanding programs in the health sciences at University of New Mexico, Albuquerque, have resulted in the creation of a new administrative position at the vice presidential level. Robert S. Stone, MD, Dean of the UNM School of Medicine, has been appointed Vice President for Health Sciences.

Dr. Stone will be responsible for coordinating the University's programs in medicine, pharmacy, nursing, New Mexico Regional Medical Program, a county mental health-mental retardation center, and the Bernalillo County Medical Center—a 317-bed hospital recently transferred by the county to the university, for teaching purposes. He will continue as dean of the medical school, and also direct development of training programs in the allied health professions.

Dr. Stone joined the UNM faculty in 1963 as professor and chairman of the pathology department. He was named associate dean of the school in 1966 and dean in 1968.

OBITUARIES

Charles Walter Metz, MD, of Denver, died December 16, 1969 in Kansas City, Missouri after a brief illness. His home was in Prairie Village, Kansas.

Born October 6, 1890 in Nashville, Tennessee, Doctor Metz attended Vanderbilt University, and was graduated from Vanderbilt Medical School in 1912. He interned at the Nashville General Hospital. From 1915-1916, Doctor Metz was stationed in the Army at Fort Logan. He was licensed to practice medicine in Colorado in 1917. In February, 1919, he was married to the former Mae Kringel of Denver, a graduate of the St. Luke's Hospital Nursing school.

Doctor Metz was widely recognized as one of the pioneers in the field on anesthesiology in the Rocky Mountain region, and was also a member of the famous Interurban Anesthesia Society. This was a group of the earliest specialists in the field, who met informally from all parts of the country to exchange information, in the days before the formal societies were organized. During his lifetime he was accorded many honors in his specialty field and in the general areas of medical practices as well. He served as vice president and trustee of the Colorado Medical Society, and was a member of the Colorado Board of Medical Examiners. He was president of the American Society of Anesthesiologists in 1952 and was honored by the ASA distinguished service award—the first physician in the region to be so recognized. He was chairman of the section on anesthesiology of the American Medical Association and first president of the Rocky Mountain Society of Anesthesiology. He also served as clinical professor of anesthesia at the Colorado School of Medicine and as consultant at Fitzsimons General Hospital.

Doctor Metz was a member of the staffs of most of Denver's private hospitals, and was president for a term, of the staff of St. Luke's Hospital. He was also a member of Denver's renowned Osler Society.

He is survived by Mrs. Metz of Prairie Village, Kansas, by three sisters, Eloise Ryan of Seattle, Amelia Smith, Nashville, Josephine Prendergast of Colorado Springs, and a brother, J. Clarence Metz of Denver. Also surviving are his son, Col. Charles W. Metz, chief of orthopedic surgery at the Army's Walter Reed Medical center in Washington, and a daughter, Mrs. Ella Mae Holstrom of Prairie Village. There are eight grandchildren.

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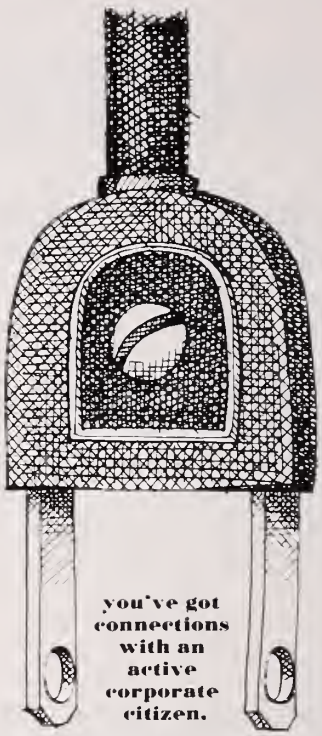

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Denver, Colorado

April 15-17, 1970

This third annual three-day symposium for physicians is designed to review modern methods of respiratory care for patients both acutely and chronically ill. Emphasis is directed toward patients with chronic airway obstruction and is oriented toward both intensive and rehabilitative care.

Tuition and registration fee: $75.00.

Ophthalmology (Estes Park, Colorado)
July 6-9, 1970

Pediatrics (Aspen, Colorado)
July 19-22, 1970

Internal Medicine (Estes Park, Colorado)
July 27-31, 1970

Hospital Medical Staff Conference
(Estes Park, Colorado)
September 28-October 2, 1970

High Risk Infant Care
February 2-6, 1970
October 5-9, 1970

For further information and detailed programs, write to: The Office of Postgraduate Medical Education, University of Colorado School of Medicine, 4200 E. Ninth Avenue, Denver, Colorado 80220.

23d Annual Symposium
on Pulmonary Disease
Fitzsimons General Hospital
Denver, Colorado

September 14-17, 1970

Information concerning enrollment may be obtained from the Program Director, Pulmonary Disease Symposium, Fitzsimons General Hospital, Denver, Colorado 80240.

9th Annual Seminar on Cancer of the Breast
Brown Palace Hotel, Denver, Colorado

May 14-16, 1970

For further information, contact Chairman of Local Arrangements Committee, Wendell P. Stampfli, MD, Director, Dept. of Radiology, St. Luke's Hospital, Denver, Colorado.

Postgraduate Course in Obstetrics
and Newborn Medicine
Snowmass-at-Aspen, Colorado

June 22-26, 1970

Tuition is $125.00. For further information, write Mrs. Vera E. Drose, Dept. of Obstetrics and Gynecology, Box 2302, University of Colorado Medical Center, 4200 East 9th Ave., Denver, Colo. 80220.

University of Colorado School of Medicine
Postgraduate Medical Education
Internal Medicine
YMCA Conference Center
Estes Park, Colorado

July 27-31, 1970

Tuition fee is $90.00 including a non-refundable registration fee of $10.00 payable upon application for admission. For detailed program write to The Office of Postgraduate Medical Education, The University of Colorado School of Medicine, 4200 East 9th Ave., Denver, Colo. 80220. For lodging information write to: Conference Registrar, YMCA of the Rockies, 25 East 16th Ave., Denver, Colo. 80202, or John Marks, the Brynwood Motel, 1100 Moraine Park Rd., Estes Park, Colo. 80517.

Children's Hospital
Denver, Colorado

Pediatric Surgery (Children's Hospital, Denver)
April 24, 1970

Neonatal Infections (A CDC Symposium), (Children's Hospital, Denver)
May 22, 1970

Teenagers (Children's Hospital, Denver)
June 12, 1970

Vail Conference on Pediatric Practice (Vail, Colorado) (Sponsored by Denver Children's Hospital)
September 17, 18, 19, 1970

5th Annual Colorado-Nebraska Obstetric and Pediatric Conference (Children's Hospital, Denver)
October 30-31, 1970

The W. Wiley Jones Memorial Lecture (Children's Hospital, Denver)
November 13, 1970

Pediatric Neurology (Children's Hospital, Denver)
December 11, 1970

For further information contact: L. Joseph Butterfield, M.D., Director, Department of Continuing Education, Children's Hospital, 1056 East 19th Avenue, Denver, Colorado 80218.

American Gastroenterological Association
Postgraduate Course on Hepatitis
Snowmass-at-Aspen, Colorado
August 20-22, 1970

For information write to Mrs. Bernie C. Kern, 740 Krameria St., Denver, Colorado 80220.

Quantitative Methods Workshop
Vail, Colorado
July 13-16, 1970

This meeting is part of the Continuing Education Program for the Department of Preventive Medicine, Division of Health Administration, University of Colorado Medical Center, Denver, Colorado. For more information, contact Arvid B. Brekke at this address.

Montana Medical Association
23rd Interim Meeting
Holiday Motel, Helena, Montana
April 3-4, 1970

Montana Tuberculosis Association
Annual Meeting
Florence Hotel, Missoula, Montana
April 23-25, 1970

Contact L. R. Hegland, Montana Medical Association, P.O. Box 1692, Billings, Montana 59103.

12th Annual Western Cancer Seminar
Frontier Hotel, Las Vegas, Nevada
May 4-5, 1970

Topics to include: Leukemia and Lymphomas; Head and Neck Chemotherapy; Use of Chemotherapeutic Agents; Mammography and Thermography; Terminal Patient Management, Etc.

Write: American Cancer Society, Nevada Division, Inc., Las Vegas, Nevada.

Nevada State Medical Association
67th Annual Meeting
Sahara Tahoe Hotel, Stateline, Nevada
October 21-24, 1970

Symposium on Stroke
Holiday Inn East
Albuquerque, New Mexico
May 22-23, 1970

For further information contact: Mrs. Elizabeth M. Barnett, Coordinator, Continuing Education, New Mexico Regional Medical Program, The University of New Mexico School of Medicine, Albuquerque, New Mexico 87106.

University of Utah College of Medicine
Division of Postgraduate Medical Education
Venereal Disease Conference
Classroom A, University of Utah
Medical Center,
Salt Lake City, Utah
April 3, 1970

Fee: $5.00, Credit (AAGP): 7 hours.

For further information, contact the University of Utah College of Medicine at the above address.

Nitrous Oxide Analgesia
College of Nursing
University of Utah, Salt Lake City, Utah
May 15-16, 1970

This program is specially designed for dentists. Friday's session will be devoted entirely to lectures. All day Saturday will be spent in actual administration of nitrous oxide analgesia, using a variety of machines. Attendance is limited to 75 persons so that ample time may be available for every attendee to become proficient in the technics. Those interested should remit without delay a $5 registration fee to insure their reservation. Fee for the actual course is an additional $95 which may be included in the same check (totaling $100) or paid on arrival at the course. Make checks payable to the Division of Post-Graduate Medical Education, University of Utah.

American Medical Association
23rd National Conference on Rural Health
Pfister Hotel and Tower
Milwaukee, Wisconsin
April 9-10, 1970

10th International Cancer Congress
Houston, Texas
May 22-29, 1970

For further information contact Dr. Alan Scott, Coordinator of Public Information, Tenth International Cancer Congress, Box 20465, Astrodome Station, Houston, Texas 77025.

Lincoln County Medical Society
Diabetes Mellitus
North Platte, Nebraska
June 16, 1970

For further information concerning this meeting, contact James E. Nickel, MD, Program Coordinator, 102 South Elm, North Platte, Nebraska 69101.

American Medical Association
1970 Annual Meeting
Palmer House, Chicago, Ill.
June 21-25, 1970

Postgraduate Medical Education
The Mound Park Hospital Foundation
St. Petersburg, Florida
The Pulse of Laboratory Medicine
April 16-18, 1970

Pediatric and Adolescent Psychiatry
May 21-23, 1970

The Mound Park Hospital Foundation, with the joint sponsorship of the Dept. of Medical Education of the Bayfront Medical Center, the University of Florida College of Medicine, Pinellas County Medical Society and the Florida Academy of General Practice, are pleased to announce these Postgraduate courses.

For information write Postgraduate Medical Education, Mound Park Hospital Foundation, Inc., St. Petersburg, Florida 33701.

American Academy of Pediatrics
1970 Annual Spring Session
Washington Hilton Hotel
Washington, D.C.
April 13-15, 1970

For further information contact: Dept. of Public Information, 1801 Hinman Ave., Evanston, Ill. 60204.

To the Editor:

I have just read, and am now rereading the most interesting editorial by Geraldine Caldwell* entitled "The High Cost of Medical Care: Who Is Responsible?" and I am enjoying it immensely. Somebody had to say the things that need to be said, and I am glad that she was the one who undertook this task and who accomplished it so well.

Those of us who are non-physicians in the medical world should be aware of these truths and I feel the things that she has so clearly delineated should stiffen the backs of all of us, including our professional bosses!

Again, my appreciation and my respects.

Nelson B. Neff,
Executive Director,
Nevada State Medical Association

*Deceased February 5, 1970.

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY

Twenty-Fourth Annual Meeting, Washington, D.C.

September 14-20, 1970

The American EEG Society announces that the 1970 Meeting will be held in Washington, D.C. at the Shoreham Hotel. The Scientific Session is to be held on the 17, 18 and 19 of September, 1970. Members, as well as non-members, are invited to submit abstracts for the presentation at the meeting by June 1, 1970. The abstracts should be submitted to: Dr. Reginald Bickford, Department of Neurosciences, University of California, LaJolla, California 92037.

The Women's Auxiliary of the American Electroencephalographic Society offers an annual award, known as the Hans Berger Award, of $300.00 for a meritorious manuscript dealing with electroencephalography, either clinical or experimental. Eligibility for the award is limited to indivduals at pre-doctoral (ph.D. or M.D.) and early post-doctoral levels. Candidates shall not be more than five years post-doctoral or two years post-residency.

The paper selected will be included as part of the Society's scheduled scientific program. A paper which has been submitted to the Program Committee for regular presentation may also be considered for the award. In this case, the **full** manuscript must be submitted to the Program Committee with the notation that it is submitted for consideration for the award.

Publication rules and suggestions to authors

1. Who may submit articles. The Rocky Mountain Medical Journal ordinarily accepts only articles prepared by members of the state societies we serve and by guest speakers at their official meetings.

2. Method of preparation. All material for publication must be typewritten, double spaced, with liberal margins, using only one side of the paper, pages consecutively numbered, and preferably on standard 8½ x 11 white bond paper. Carbon copies are *not* acceptable.

Title (preferably short) and author's name, city and state must appear at the top of the first page. Second and subsequent pages should be identified with consecutive page numbers and author's surname. If physician authors possess more than one degree, the MD only is used. Lesser degrees of non-MD authors or co-authors may be used.

Please include beneath the title or at the top of the first page a brief paragraph stating what the article is designed to show and, therefore, why it should be read. This introductory feature is, in editorial parlance, called the "blurb"; it is printed in bold type.

3. Where to submit material. All copy must be sent to the editor for the state in which the material originates. Editors for each state, with their mailing addresses, are listed monthly on the Table of Contents page of the Journal.

4. Acceptance or rejection. The state editor will (1) tentatively accept the article, (2) return it to the author with suggestions for revision, or (3) reject it. He will edit and forward approved copy to the publication office in Denver for final editing and scheduling.

5. Order of publication. Ordinarily, articles will be published in the order received. Those whose value is seasonal, whose value would be lost if publication is delayed, or which reflect priority of original research, are given special consideration. State presidential addresses, programs, state society minutes, and timely organization announcements are given priority.

6. Length of articles. Scientific papers should be "boiled down" not to exceed ten pages of double-spaced typewritten standard 8½ x 11 inch sheets. Shorter papers are more acceptable to editors and readers, and earlier publication is probable. Every journal is in competition for the reader's time, and condensation is the order of the day. For this reason, and because of financial and space limitations, we request that copy be condensed to the greatest extent consistent with conveying the message.

7. Illustrations. A limited number of illustrations or "cuts," usually up to six, will ordinarily be accepted within our own publication budget if the editor believes they enhance the value of the article. Clear photos, simple diagrams or line drawings in black on white, printing rather than writing, reproduce well. Cuts should be mounted separately, and the paper or cardboard mounts should be the same size as that upon which the article is typed. Each should have its caption below: Fig. 1, Fig. 2, etc., with a short descriptive sentence. Authors will be billed our cost for excess above six cuts.

8. Tables. Tables should be simple, presenting only brief relevant data, amply spaced. They should be placed at the back of the manuscript on separate sheets. Each should have its number and title above: Table 1, Title; Table 2, Title; etc. Long, large, or complicated tables ordinarily are not acceptable.

9. Case reports. Case reports are popular with our readers. A brief introductory statement concerning the condition or disease, tells why the case is presented. The report follows with a separate heading, CASE REPORT or CASE 1, CASE 2, etc. Include only relevant, positive laboratory and other data. Names, initials, and numbers are unimportant; age, sex, and sometimes occupation are significant. Minimize dates; then make it month, date, year—as February 9, 1969; not 2/9/69. After the case presentation, review or sum it up under a heading such as Discussion, Comment, Summary or Conclusion.

10. Footnotes. Footnotes must be brief. One at the bottom of the first page should state the Society and date of presentation, and institutional origin, if any. Special titles or position of the author, acknowledgements, etc., will be added according to simplicity, editorial policy and discretion.

11. References. Reference lists rarely add to the value of an article for the majority of readers. We will make every effort to publish short reference lists, but long ones will be deleted. Incidentally, the proper heading is "References," not "Bibliography." The latter implies everything in the literature upon the subject. Make them uniform in style and brief, as: Jones, W. K.: Pyelonephritis in Infancy. JAMA 141:75. 1964.

12. Editorials. We would like to have more submitted by our State editors and the membership at large. Readers must get tired of thunder from publication headquarters in Denver; frankly, we do too! Speak out, and we'll sign your name, initials, or respect your request for anonymity, as you choose. If you don't like something we do or say, please let us in on it; we could even stand to hear about it if something happens to please you. A "Letter to the Editor" may help you get something off your mind. We're asking for it and we have a place to put it—in the Journal, that is!

13. Proofs. Galley proofs are submitted to the author, and prompt return is essential. Authors should correct typographical, grammatical, or rhetorical errors, but do not reinsert or rewrite sentences, paragraphs, tables, etc., which an editor may have deleted, condensed, or paraphrased. When an article reaches the galley-proof stage, the author may NOT re-edit his article; that is the privilege of the Journal's editors.

14. Reprints. Most authors desire reprints. Our printing firm provides them on a non-profit basis. They MUST be ordered when the author submits his corrected proof.

15. Our Journal is copyrighted. We and most state and regional journals owned by state medical societies have granted each other continuing copyright permission to copy or quote with proper credit. Copyright permission is not granted to commercial or privately owned publications.

Contraindications: Edema, danger of cardiac decompensation; history or symptoms of peptic ulcer; renal, hepatic or cardiac damage; history of drug allergy; history of blood dyscrasia. The drug should not be given when the patient is senile or when other potent drugs are given concurrently. Large doses of the alka formulation are contraindicated in glaucoma.

Warning: If coumarin-type anticoagulants are given simultaneously, watch for excessive increase in prothrombin time. Instances of severe bleeding have occurred. Persistent or severe dyspepsia may indicate peptic ulcer; perform upper gastrointestinal x-ray diagnostic tests if drug is continued. Pyrazole compounds may potentiate the pharmacologic action of sulfonylurea, sulfonamide-type agents and insulin. Carefully observe patients receiving such therapy. Use with caution in the first trimester of pregnancy and in patients with thyroid disease.

Precautions: Before prescribing, carefully select patients, avoiding those responsive to routine measures as well as contraindicated patients. Obtain a detailed history and a complete physical and laboratory examination, including a blood count. Patients should not exceed recommended dosage, should be closely supervised and should be warned to discontinue the drug and report immediately if fever, sore throat, or mouth lesions (symptoms of blood dyscrasia); sudden weight gain (water retention), skin reactions, black or tarry stools or other evidence of intestinal hemorrhage occur. Make complete blood counts at weekly intervals during early therapy and at 2-week intervals thereafter. Discontinue the drug immediately and institute countermeasures if the white count changes significantly, granulocytes decrease, or immature forms appear. Use greater care in the elderly and in hypertensives.

Adverse Reactions: The more common are nausea and edema. Swelling of the ankles or face may b minimized by withholding dietary salt, reduction in dosage or use of diuretics. In elderly patients and in those with hypertension the drug should be discontinued with the appearance of edema. The drug has been associated with peptic ulcer and may reactivate a latent peptic ulcer. The patient should be instructed to take doses immediately before or after meals or with milk to minimize gastric upset. Drug rash occasionally occurs. If it does, promptly discontinue the drug. Agranulocytosis, exfoliative derma-

Sandy sails again!
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His rheumatoid arthritis flared out of aspirin control. It meant weeks of pain, stiffness, swelling and tenderness...and a lot of sun and wind that somebody else took advantage of.

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Serious side effects can occur. Select patients carefully (particularly the elderly) and follow them closely in line with the drug's precautions, warnings and contraindications. Read the prescribing information. It's summarized below.

Stevens-Johnson syndrome, l's syndrome (toxic necrotizing ermolysis),or a generalized gic reaction similar to serum ness may occur and require nanent withdrawal of medica- Agranulocytosis can occur denly in spite of regular, repeated nal white counts. Stomatitis rarely, salivary gland enlarge- it may require cessation of treat- it. Such patients should not ive subsequent courses of the g. Vomiting, vertigo and languor occur. Leukemia and leukemoid ctions have been reported. While definitely attributable to the g, a causal relationship cannot be excluded. Thrombocytopenic purpura and aplastic anemia may occur. Confusional states, agitation, headache, blurred vision, optic neuritis and transient hearing loss have been reported, as have hyperglycemia, hepatitis, jaundice, hypersensitivity angiitis, pericarditis and several cases of anuria, glomerulonephritis and hematuria. With long-term use, reversible thyroid hyperplasia may occur infrequently. Moderate lowering of the red cell count due to hemodilution may occur.

Dosage in Rheumatoid Arthritis: Initial: 3 to 6 capsules daily in 3 or 4 equal doses. Trial period: 1 week. Maintenance dosage should not exceed 4 capsules daily, response is often achieved with 1 or 2 capsules daily. In selecting the appropriate dosage in any specific case, consideration should be given to the patient's weight, general health, age and any other factors influencing drug response. (B)46-070-C
For complete details, please see full prescribing information.

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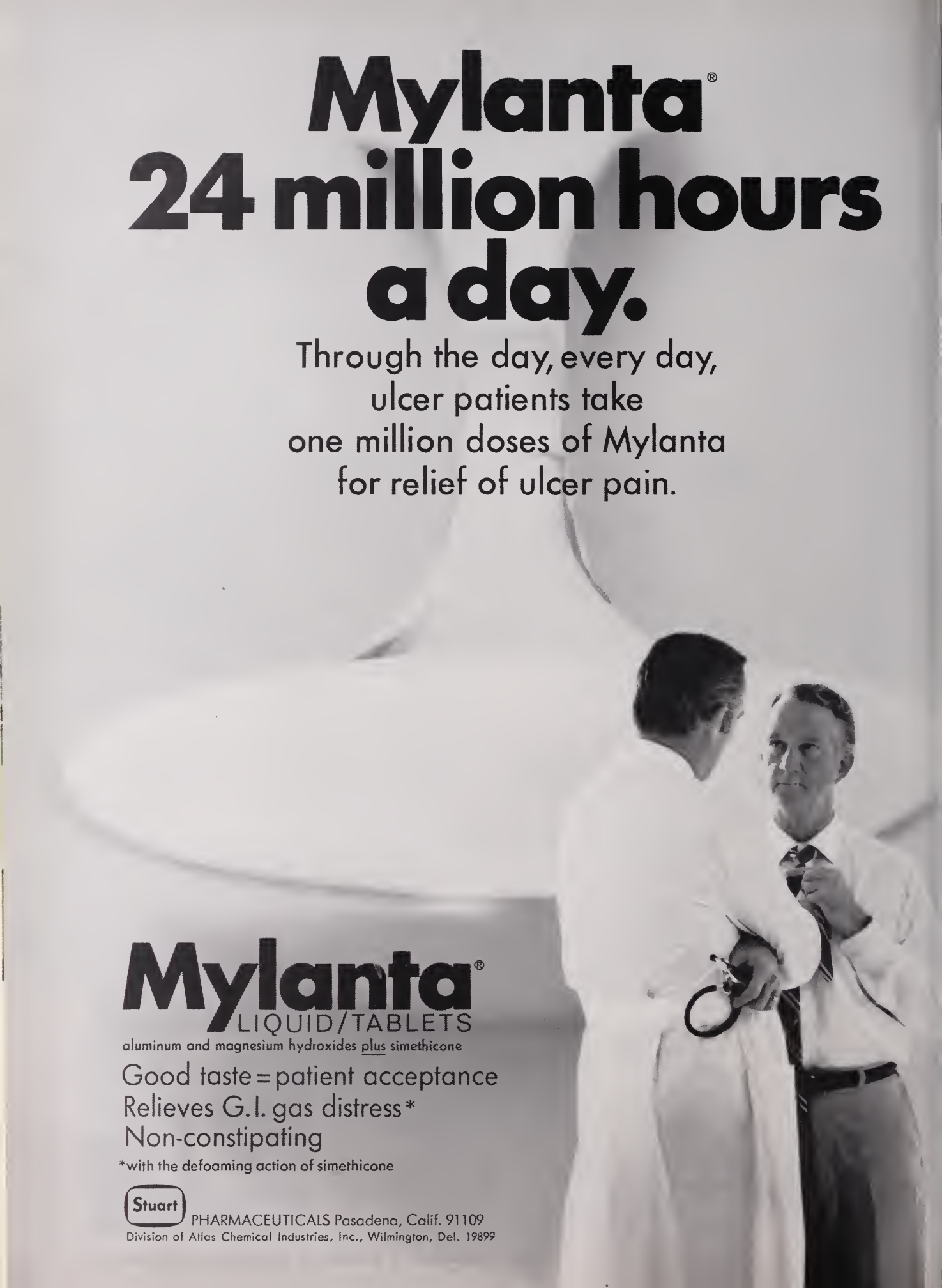

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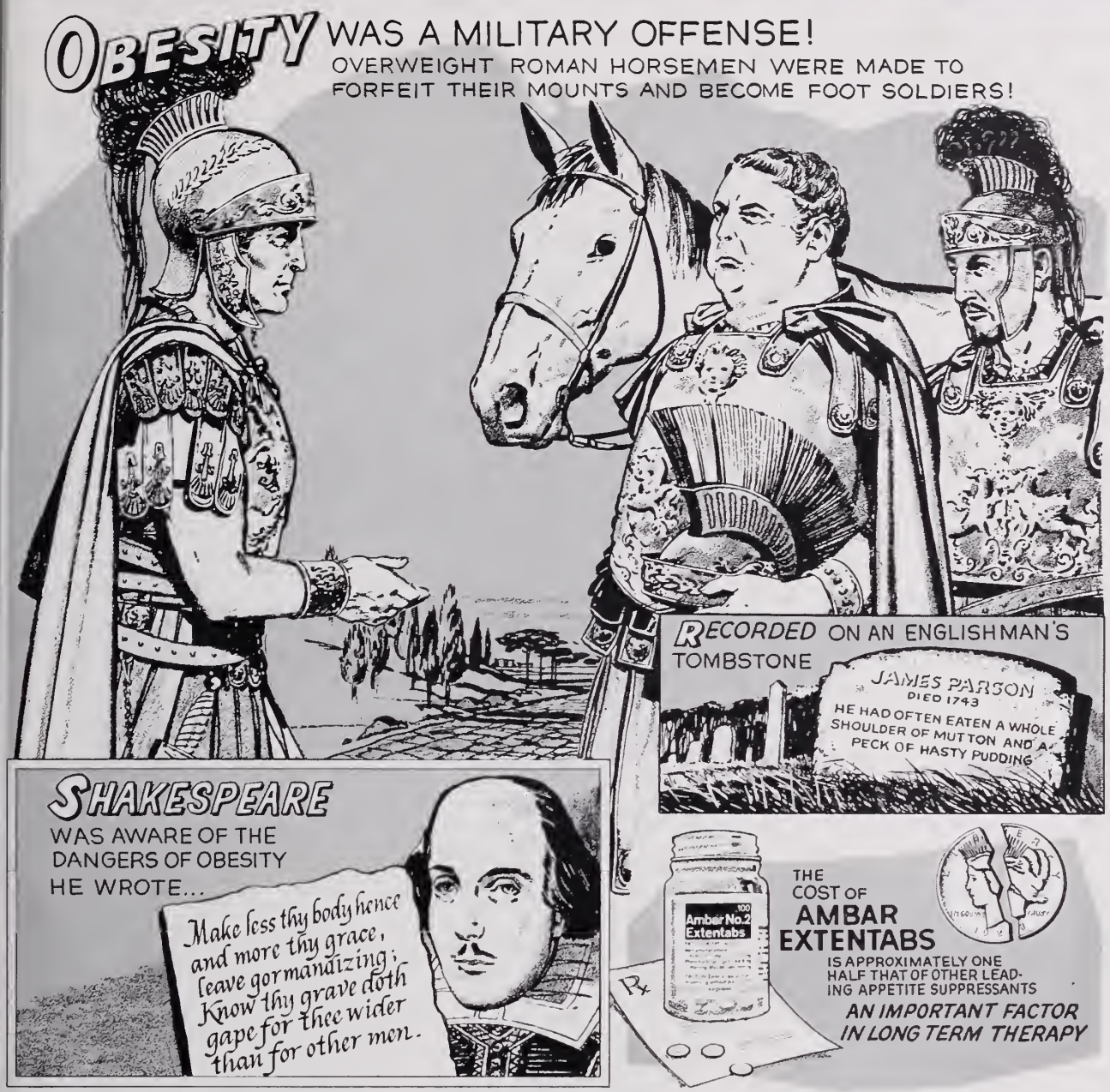
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One Ambar Extentab before breakfast can help control most patients' appetite for up to 12 hours. Methamphetamine, the appetite suppressant, gently elevates mood and helps overcome dieting frustrations. Phenobarbital, the sedative in Ambar, controls irritability and anxiety...helps maintain a state of mental calm and equanimity. Both work together to ease the tensions that erode the willpower during periods of dieting.

Also available: Ambar #1 Extentabs®—methamphetamine hydrochloride 10 mg., phenobarbital 64.8 mg. (1 gr.) (Warning: may be habit forming).

BRIEF SUMMARY/**Indications:** Ambar suppresses appetite and helps offset emotional reactions to dieting. **Contraindications:** Hypersensitivity to barbiturates or sympathomimetics; patients with advanced renal or hepatic disease. **Precautions:** Administer with caution in the presence of cardiovascular disease or hypertension. **Side Effects:** Nervousness or excitement occasionally noted, but usually infrequent at recommended dosages. Slight drowsiness has been reported rarely. See package insert for further details.

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do for these patients?

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(INDOMETHACIN | MSD)

helps relieve pain, fever,
swelling, and tenderness

Please see new prescribing information on following page.

REVISED PRESCRIBING INFORMATION

IMPORTANT NOTE: INDOCIN (Indomethacin, MSD) cannot be considered a simple analgesic and should not be used in conditions other than those recommended under Indications. The drug should not be prescribed for children because safe conditions for use have not been established.

General Adverse Effects: Because of the high potency of the drug and the variability of its potential to cause adverse reactions, the following are strongly recommended: 1) the lowest possible effective dose for the individual patient should be prescribed. Increased dosage tends to increase adverse effects, particularly in doses over 150-200 mg/day, without corresponding clinical benefits; and 2) careful instructions to, and observations of, the individual patients are essential to the prevention of serious and irreversible, including fatal, adverse reactions, especially in the aging patient.

Indications: Symptomatic relief of adult rheumatoid and degenerative joint disease unresponsive to adequate trial of salicylates and other measures of established value, such as appropriate rest. Has been found effective in active stages of: 1) moderate to severe rheumatoid arthritis including acute flares of chronic disease, 2) moderate to severe rheumatoid (ankylosing) spondylitis, and 3) moderate to severe degenerative joint disease of the hip (osteoarthritis of the hip). Has been found effective in relieving pain and reducing fever, swelling, and tenderness in acute gouty arthritis in selected patients. May enable reduction of steroid dosage in patients receiving steroids for the more severe forms of rheumatoid arthritis; in such instances the steroid dosage should be reduced slowly and the patients followed very closely for any possible adverse effects.

Contraindications: Children 14 years of age and under; pregnant women and nursing mothers; active gastrointestinal lesions or history of recurrent gastrointestinal lesions; allergy to aspirin and indomethacin.

Warnings: *Gastrointestinal Effects:* Because of the occurrence and, at times, severity of gastrointestinal reactions, be continuously alert for any sign or symptom signaling a possible gastrointestinal reaction. The risks of continuing therapy with INDOCIN in the face of such symptoms must be weighed against the possible benefits to the individual patient. Gastrointestinal effects may be reduced by giving the drug immediately after meals, with food, or with antacids. Use greater care in aging patients.
Ocular Effects: Corneal deposits and retinal disturbances, including those of the macula, have been observed in some patients on prolonged therapy. Discontinue therapy if such changes are observed. Ophthalmologic examination at periodic intervals is desirable in patients on prolonged therapy.
Central Nervous System Effects: INDOCIN (Indomethacin, MSD) may aggravate psychiatric disturbances, epilepsy, and parkinsonism, and should be used with considerable caution in patients with these conditions. If severe CNS reactions develop, discontinue the drug.

Precautions: Blurred vision may be a significant symptom that warrants a thorough ophthalmologic examination. Patients should be cautioned about engaging in activities requiring mental alertness and motor coordination, as driving a car. Headache which persists despite dosage reduction requires complete cessation of the drug. May mask the usual signs and symptoms of infection; therefore, the physician must be continually on the alert for this and should use the drug with extra care in the presence of existing controlled infection. After the acute phase of the disease is under control, an attempt to reduce the daily dose should be made repeatedly until the patient is off entirely.

Adverse Reactions: *Gastrointestinal Reactions:* Single or multiple ulcerations of the esophagus, stomach, duodenum, or small intestine, including perforation and hemorrhage, with fatalities in some instances; gastrointestinal bleeding without obvious ulcer formation; perforation of preexisting sigmoid lesions (diverticulum, carcinoma, etc.); rarely, increased abdominal pain in ulcerative colitis patients or development of ulcerative colitis and regional ileitis; gastritis, which may persist after the cessation of the drug; nausea, vomiting, anorexia, epigastric distress, abdominal pain, and diarrhea.
Eye Reactions: Corneal deposits and retinal disturbances, including those of the macula, have been observed on prolonged therapy; blurring of vision.
Hepatic Reactions: Rarely, toxic hepatitis and jaundice, including some fatal cases.
Hematologic Reactions: Aplastic anemia, hemolytic anemia, bone marrow depression, agranulocytosis, leukopenia, and thrombocytopenic purpura. Since some patients manifest anemia secondary to obvious or occult gastrointestinal bleeding, appropriate blood determinations are recommended.
Hypersensitivity Reactions: Acute respiratory distress, including dyspnea and asthma; angiitis; pruritus; urticaria; angioedema; skin rashes.
Ear Reactions: Hearing disturbances, deafness, tinnitus.
Central Nervous System Reactions: Psychotic episodes, depersonalization, depression, coma, convulsions, peripheral neuropathy, drowsiness, mental confusion, lightheadedness, dizziness, headache.
Cardiovascular-Renal Reactions: Edema, elevation of blood pressure, hematuria.
Dermatologic Reactions: Loss of hair, erythema nodosum.
Miscellaneous: Rarely, vaginal bleeding, hyperglycemia, glycosuria, ulcerative stomatitis, and epistaxis.

Supplied: Capsules containing 25 mg indomethacin each, in bottles of 100 and 1000; capsules containing 50 mg indomethacin each, in bottles of 100.

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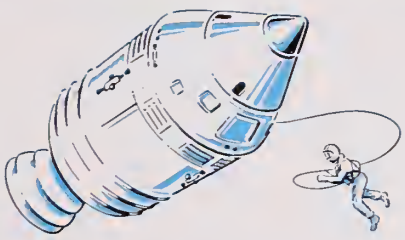

Man in space, now fait accompli, re-emphasizes the importance of Uro-Phosphate therapy. Research into the effect of space travel on the astronaut reveals that weightlessness causes loss of bone calcium. As the bones are required to bear less and less of the weight of the body they lose calcium, increasing the calcium content of the urine. When physical activity is reduced, the acidity of the urine should be adjusted to keep increased calcium in solution . . . . a prophylaxis to prevent kidney or bladder calculi.

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Each tablet contains: METHENAMINE, 300 mg.; SODIUM ACID PHOSPHATE, 500 mg.

Uro-Phosphate gives comfort and protection when inactivity causes discomfort in the urinary function. It keeps calcium in solution, preventing calculi; it maintains clear, acid, sterile urine; it encourages complete voiding and lessens frequency when residual urine is present.

Uro-Phosphate contains sodium acid phosphate, a natural urinary acidifier. This component is fortified with methenamine which is inert until it reaches the acid urinary bladder. In this environment it releases a mild antiseptic keeping the urine sterile.

Uro-Phosphate is safe for continuous use. There are no contra-indications other than acidosis. It can be given in sufficient amount to keep the urine clear, acid and sterile. A heavy sugar coating protects its potency.

Dosage:

For protection of the inactive patient 1 or 2 tablets every 4 to 6 hours is usually sufficient to keep the urine clear, acid and sterile.

2 tablets on retiring will keep residual urine acid and sterile, contributing to comfort and rest.

A clinical supply will be sent to physicians and hospitals on request.

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listeriosis
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septicemias
sinusitis
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tonsillitis
tularemia
typhus fever
urethritis

...don't you think it's time we were on a first-name basis?

call me "Achro® V"

Every pharmacist knows ACHRO® V stands for ACHROMYCIN® V

Contraindications: Hypersensitivity to tetracycline.
Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.
Precautions: Nonsusceptible organisms may overgrow; treat superinfection appropriately. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).
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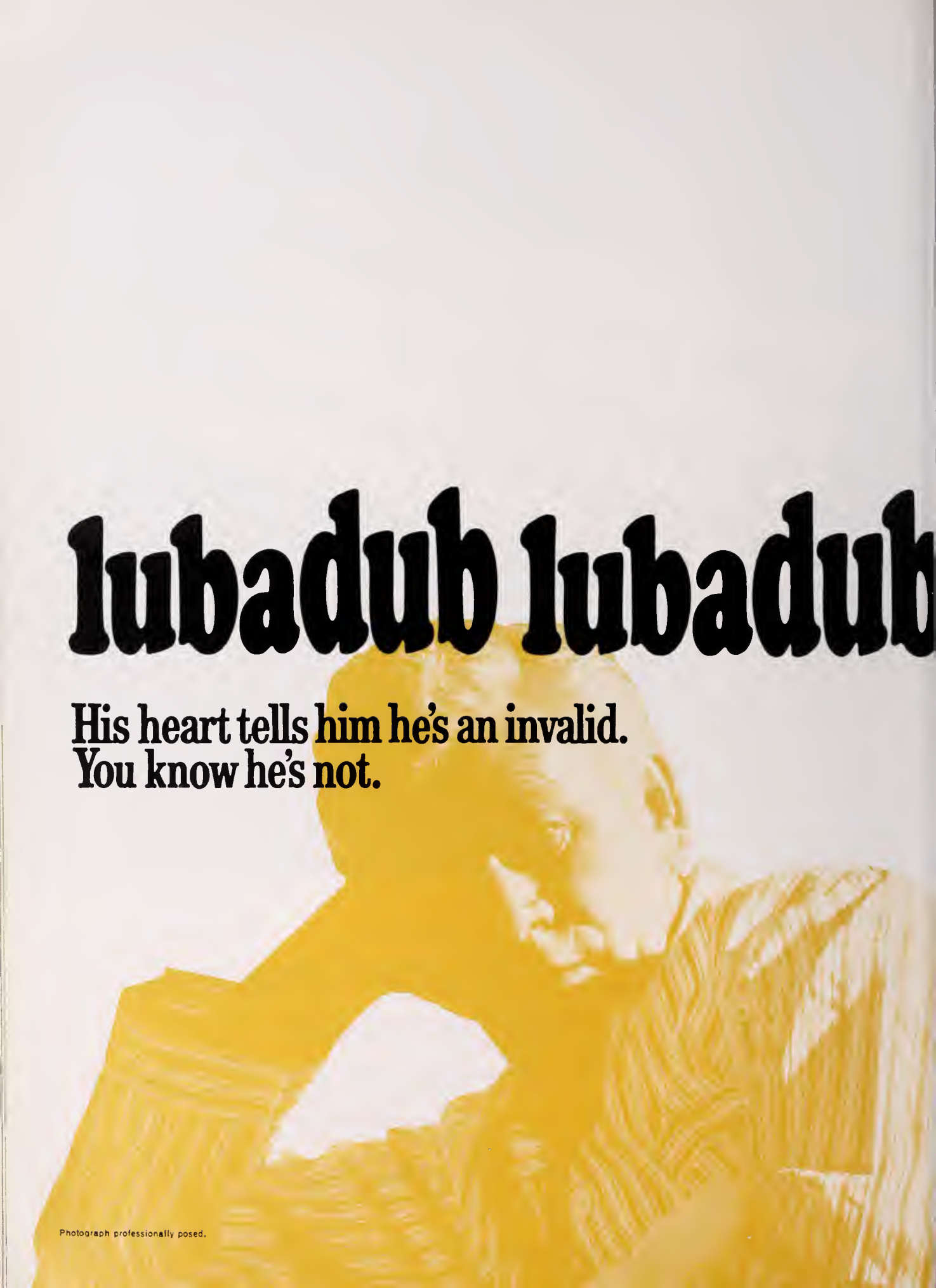

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Important Precautions: Carefully supervise dose and amounts prescribed, especially for patients prone to overdose themselves. Excessive prolonged use has been reported to result in dependence or habituation in susceptible persons, as alcoholics, ex-addicts, and other severe psychoneurotics. After prolonged excessive dosage, reduce dosage gradually to avoid possibly severe withdrawal reactions. Abrupt discontinuance of excessive doses has sometimes resulted in epileptiform seizures.

Warn patients of possible reduced alcohol tolerance, with resultant slowing of reaction time and impairment of judgment and coordination.

Reduce dose if drowsiness, ataxia or visual disturbance occurs; if persistent, patients should not operate vehicles or dangerous machinery.

Side Effects include drowsiness, usually transient; if persistent and associated with ataxia, usually responds to dose reduction; occasionally concomitant CNS stimulants (amphetamine, mephentermine sulfate) are desirable. Allergic or idiosyncratic reactions are rare, but such reactions, sometimes severe, can develop in patients receiving only 1 to 4 doses who have had no previous contact with meprobamate. Previous history of allergy may or may not be related to incidence of reactions. Mild reactions are characterized by itchy urticarial or erythematous maculopapular rash, generalized or confined to groin. Acute nonthrombocytopenic purpura with cutaneous petechiae, ecchymoses, peripheral edema and fever have been reported. One fatal case of bullous dermatitis following intermittent use of meprobamate with prednisolone has been reported. If allergic reaction occurs, meprobamate should be stopped and not reinstituted. Severe reactions, observed very rarely, include angioneurotic edema, bronchial spasms, fever, fainting spells, hypotensive crises (1 fatal case), anaphylaxis, stomatitis and proctitis (1 case) and hyperthermia. Treat symptomatically as with epinephrine, antihistamine and possibly hydrocortisone. Aplastic anemia (1 fatal case), thrombocytopenic purpura, agranulocytosis and hemolytic anemia have occurred rarely, almost always in presence of known toxic agents. A few cases of leukopenia, usually transient, have been reported on continuous administration.

Meprobamate may sometimes precipitate grand mal attacks in patients susceptible to both grand and petit mal. Extremely large doses can produce rhythmic fast activity in the cortical pattern. Impairment of accommodation and visual acuity has been reported rarely. After excessive dosage for weeks or months, withdraw gradually (1 or 2 weeks) to avoid recurrence of pretreatment symptoms (insomnia, severe anxiety, anorexia). Abrupt discontinuance of excessive doses has sometimes resulted in vomiting, ataxia, tremors, muscle twitching and epileptiform seizures. Prescribe very cautiously and in small amounts for patients with suicidal tendencies. Suicidal attempts have resulted in coma, shock, vasomotor and respiratory collapse and anuria. Excessive doses have resulted in prompt sleep; reduction of blood pressure, pulse and respiratory rates to basal levels; and occasionally hyperventilation. Treat with immediate gastric lavage and appropriate symptomatic therapy. (CNS stimulants and pressor amines as indicated.) Doses above 2400 mg./day are not recommended.

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little may even be desirable.

ut when anxiety is exaggerated . . . when it
terferes with sleep . . . when it aggravates
ardiovascular symptoms, your help may
e needed.

laturally, you'll want to reassure the patient.

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President's Message

THE MARCH, 1970 Special Nevada Edition of the *Rocky Mountain Medical Journal* makes the fifth year in which we in Nevada have been privileged to participate in an edition of this Journal. As President of the Nevada State Medical Association it is a privilege for me to greet the members of the Rocky Mountain Medical Conference and, further, to utilize an article in the March, 1967, issue of the *Rocky Mountain Medical Journal* written by John W. Batdorf, MD, of Las Vegas for comment. His article is as timely now as it was then.

In this report Dr. Batdorf detailed his experiences working in hospitals in Vietnam for two months as an American Volunteer Physician in the city of Da Nang. While the environment made it impossible for medicine and surgery to be adequately practiced in that war-disturbed area, he concludes with a most optimistic statement, "It will take a long time to understand what occurred, or even recognize it, yet one shortly becomes aware of what you, yourself are—some good —some bad. Nevertheless all is raw and brutally awakening. Were we only able as Whitman, to 'See a new city filled with robust love'. Perhaps, unlike Whitman, we realize for the world this robust love comes only at an unfathomable price. I am not sure we will be either able or willing to pay. Scientific medicine? Educational surgery? No. Yet, here was an experience where one appreciates being a doctor with the zeal of a third-year medical student in his first day on a ward."

If a physician coming out of an experience such as Doctor Batdorf's can appreciate this experience and still go forward with the zeal of a third-year medical student, what real problems are there that we cannot overcome? Currently our individual and collective responsibilities seem to many of us to be overwhelming. Yet, as compared to awesome and awful responsibilities of physicians and surgeons in war torn areas of Southeast Asia, we don't have it so bad after all.

The new charges placed on physicians by Title XVIII and Title XIX programs, the problems of utilization and peer review, of continuing medical education, and many many more, while they have increased the workload, nonetheless the total advances in methods of health care delivery have continued to make it possible for us to carry all of these loads and to function as never before possible.

1969 was a year of progress for medicine in Nevada. Nevada Blue Shield Plan is now operational and the Title XIX program in Nevada is being administered by our own Blue Shield. The Legislature, giving the proper go-ahead, has made it possible for a new and forward-looking program to be developed for the training and education of medical and paramedical personnel. Nursing school programs on our two campuses are forging ahead. Resident training programs are slowly, but surely, coming into clear focus. Due to the work during the year by our AMPAC-NEMPAC efforts, our relationship with the legislators during the 1969 regular session was never more effective.

Our 1970 Annual Meeting is scheduled for October 21 through 24 at the Sahara-Tahoe Hotel, Lake Tahoe. The Program Committee has been working on details of the scientific portion of the meeting for the past four months and an excellent program is in the making. I urge all members of the Association now to plan to attend this most important annual gathering, our 67th, and cordially invite all members of the Rocky Mountain Medical Conference to join us in what will be, I know, a most excellent session. The 1971 meeting of our Association to be held in Las Vegas will be a Rocky Mountain Mountain Medical Conference gathering and it, too, will be a well organized and informative meeting in the highest tradition of good medical programming. This latter session will be October 21-24, 1971 at The Sands Hotel,

Las Vegas, whose superb facilities will assist in making the meeting meaningful—and I will plan to see all of you at both of these sessions.

V. A. Salvadorini, MD
President

Title XIX and Nevada Physicians

As it is in most of the country, Medicaid, or Title XIX, is in trouble in Nevada. The trouble is many-faceted, and solutions are not coming easily. Good medical care is now a right. That is what the patient is told by the federal government, but the State Department of Health, Education and Rehabilitation limits what care is furnished the patient. If you don't believe it, you're behind in your reading.

The problem is that the states, including Nevada, have not been able to find the money to pay for the care that is needed by these patients. This has resulted in restriction of care that will be paid for. The most recent event in Nevada has been to announce that "elective" surgery will not be paid for by Title XIX. This decision was made without consultation or even notification of the Nevada State Medical Association.

"Partnership in Health" has been proposed. Now is the time for the bureaucrats in the State Department of Health, Education and Rehabilitation to start working on partnership as a reality. Physicians are the ones who can make decisions about "elective" surgery will not be paid for by state are more familiar with the money end of the program. Why not have some "partnership" on matching available funds with necessary treatment? It was predicted very early in the game that it would fall to the physicians to make these federal programs work. The time has arrived in Nevada. The first step appears to be to sell state employees on cooperation rather than dictation.

Many solutions have been suggested for present problems in medical care delivery such as group practice, pre-paid health care, etc. This is all because fee-for-service medical care is "too expensive." Unfortunately, no one has any studies on which to base statements, either about prepaid care and its efficiency nor about fee-for-service and a supposed lack of efficiency.

What is good medical care? Who can be authoritative about this? It is a term widely used, but never defined. How do you evaluate whether a patient is getting the care he should have? Even if there were some such sage who could determine and define good care, how do we discover whether or not the patient has received this good care? Here comes peer review—we are now going to look harder at the record and tell the fiscal agent whether the patient is receiving good care and is staying the proper length of time in the hospital and in the extended care facilities and nursing homes. Peer review is not new. It has not been the answer to help either Medicare or Medicaid. Adding the pressure of state bureaus to make it work will not improve utilization. The federal and state governments have re-discovered a truism of this country—police actions just don't work.

What is the solution to this problem? How can these federal and state programs be made effective? I propose that the bureaucrats spend a great deal of time working with the physicians and dentists who provide care. It might be wise to even pay someone to do some systems analysis of the way medical care is provided in this country. It surely is the only method to start some type of solution to decisions on such things as "elective" operations.

An area in which Nevada could make a real contribution would be a true analysis of the fee-for-service. The critics of the system are in a poor position because they have no statistics to prove their point: they just think they have a better deal. Those of us who work with the fee-for-service system have just learned it. Now is the time to start figuring what goes into fee-for-service. This starts with the length of training and level of proficiency, and it goes on through the length of time needed to give the service and the difficulty of the individual case. I am sure this can all be analyzed. I am also sure there will be a great problem in putting the

treatment of patients into a sensible, thorough explanation. The California Relative Value Scale is a case in point. It is difficult to find two men who use it the same way.

What am I proposing? A study of what really goes into fee-for-service. What do I think will come out of this? I truly believe that those proposing social changes such as prepaid medical care would find that fee-for-service has really been the best deal ever conceived. The study would identify many things that have been done gratis as well as numerous things charged at a low rate compared with the time and skills involved. It would also re-emphasize that physicians charging fee-for-service and working 60 to 80 hours a week are a different breed of cat from those who work a given number of hours for a set salary.

What can be done about the quality of medical care? I don't think anyone can write down what quality care is. The only solution to quality care is education—education of all the persons who provide medical care. The education must expand to everyone in every hospital. The education must be such that all personnel can learn what is new and current. When personnel can keep current, then quality of care will be the best humans can produce.

Bureaucracy is not the answer. It has never helped in anything like medical care. Social reformers can propose all they wish. Nevada state officials can make all the rules they like. When the chips are down, improvement in medical care for all will come through cooperation with the people who produce that medical care. Cooperation is a two-way street.

Denver's Children's Hospital

Children's Hospital, a regional hospital located in Denver, celebrated its 60th anniversary in February. The area it serves nearly coincides with the circulation of the *Rocky Mountain Medical Journal.*

Children's has earned many credits in the past sixty years. But perhaps more important than what it has done in the past, is what it plans for the future. The Newborn Center at the Hospital is one of the leaders, in the United States in the care of the sick and premature newborn. Besides its unique mobile unit for emergency transport, the Newborn Center is developing a communications system with other hospitals in the area on a "hotline" basis. The Oncology Center has made great strides in the treatment of young leukemia patients. And Children's is the only Hospital in the region with its own fulltime pediatric anesthesiology staff.

The Hospital was founded by a small group of women who wanted to establish a treatment center for children, which would provide pediatric medical care for Denver and the entire Rocky Mountain region. The first patient was admitted to the Hospital on February 18, 1910. The Board of Directors of the Hospital was composed entirely of women until December, 1968, when men were first elected to serve on the governing board.

Children's Hospital strives to provide pediatric care second to none for children in the Rocky Mountain area. It has grown from 30 beds in 1910 to 185 in 1970. Last year more than 11,000 patients were admitted. These patients came from 23 states and Canada.

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*U.S. PATENT NO. 2,835,677

Adrenergic innervation of the heart, coronary arteries and cerebral blood vessels*

Richard H. Licata, Ph.D., Reno, Nevada

THE ROLE OF CARDIAC INNERVATION in the regulation of heart action is inevitably regarded an important adjunct to cardiac conduction. In general, anatomists have determined that a superficial cardiac plexus exists adjacent the major arterial outlets of the heart, whereas a deep cardiac plexus is present in contiguity with the base of the heart at the venous inlets. Further sub-plexuses may be found connecting these two systems at pulmonary levels. All nerves concerned are generally parasympathetic derivations of the vagus nerve intimately conjoined to adrenergic components originating from the sympathetic trunk at thoracic levels. One major sub-plexus thus formed is that which exists around the coronary arteries. Adrenergic neural plexuses may also be ascribed to all cardiac valves, a finding described in a prior report by the author (1967). Internally, representation of the neural plexuses described may be found within all the chambers and layers of the heart.

This present study concerns one phase of neuroregulatory control of the cardiovascular system, namely adrenergic innervation. The method employed consists of a modified technic developed by Corrodi, Hillarp, Falck, etc. for tissue preparation permitting study of in situ catecholamine resulting from induced autofluorescence. The guinea pig was selected as the experimental animal, although experiments are continuing utilizing other species.

The technic employed enables identification of adrenergic neural fibers and catecholamine stores in heart tissue. Three basic plexuses were determined to exist, namely, epicardial, myocardial and endocardial. The epicardial neural plexus is probably concerned with presso-receptor responses designed to prevent over-distention of the heart wall and possibly reflexly initiate cardiac systole. The myocardial neural plexus described (Fig. 2) represents an intrinsic neural plexus concerned with innervation of cardiac muscle basically concerned with cardiac acceleration. In addition, individual cardiac muscle fibers appear to be relatively rich in intracellular catecholamine vesicles. The subendocardial plexus was strikingly profuse and may concern itself with pressure relations prevalent within the cardiac chambers.

The intrinsic innervation of the heart was studied in great detail. Examination of the sub-endocardial layers revealed a widely distributed intricate neural plexus comprised of inter-anastomosing elements as displayed in Fig. 1. Generally the fibers concerned were structurally characterized by undulations and varicosities. Close examination revealed that many of the filaments were in reality comprised of double strands. This duplication of fiber systems indicates the existence of a coapted dual neural plexus, possibly functioning for mutual augmentation or to produce diametric effects. Among the inter-anastomosing strands lateral extensions were found representing terminal tendrils consisting of beading endings. Within the interstices were observed independent widely dispersed clusters of catecholamine granules. Occasionally structures similar to mast cells were noticed within these same

*From the Department of Anatomy, School of Medical Sciences, University of Nevada and Washoe Medical Center, Reno, Nevada.
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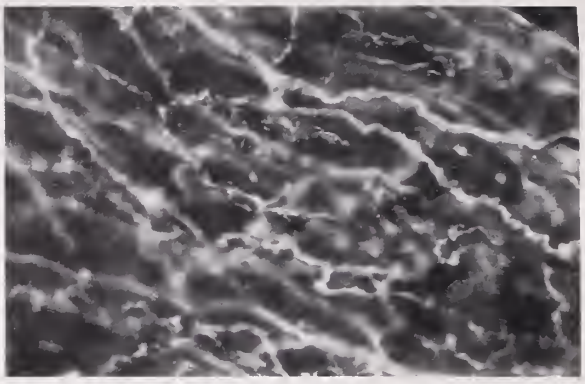

Fig. 1. Neural plexus below endocardium of right atrium at approach to atrioventricular node. (x 400).

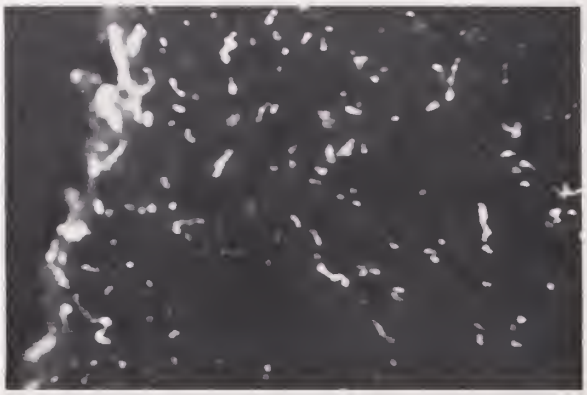

Fig. 2. Adrenergic plexus in myocardium. Notice that fluorescing nerves extend to endocardial surface to right of figure. (x 400)

spaces. Further, the individual muscle units of the myocardium exhibited a positive intrinsic catecholamine fluorescence which was however, less intense than the adrenergic nerve fibers described. Internally, within the sarcoplasm of the muscle constituents a dispersal of very fine catecholamine granules was also observed. The plexus delineated in Fig. 1 was obtained from the right atrial floor prior to the approach to the atrioventricular node. It was further found that the floor of the intercaval area or sinus venarum was comparably rich with regard to neural nets. The question of initiation of the impulse for contraction and propagation leading to final reception at the A-V node must be considered in the light of these findings. Deeper plexuses were identified representing a complex intramural myocardial innervation (Fig. 2). The illustration in Fig. 2 depicts the myocardial plexus represented in a cross-sectional plane. The contained nerves which in reality are interconnected appear as fluorescent particles due to the plane of section. Studies of serial sections revealed that the nerve units generally paralleled the pattern of muscle constituents and simultaneously formed looping connections entwining the muscle fibers. Concentrations of adrenergic fibers were found principally in the interfascicular connective tissue planes. At these locations were also found penetrating branches of coronary arteries which frequently derived neural investments from contiguous mycordial plexuses (Fig. 6). Further, the intramural network of the myocardium appeared to be co-extensive with both the sub-endocardial and the epicardial plexuses.

Additional studies were conducted on coronary arteries to determine the mode of their intrinsic innervation. Fig. 4 represents a cross sectional view of the anterior descending branch of the left coronary artery. This illustration demontrates the high concentration of adrenergic fibers within the

Fig. 3. Adrenergic nerves in leaflet of mitral valve. (x 400)

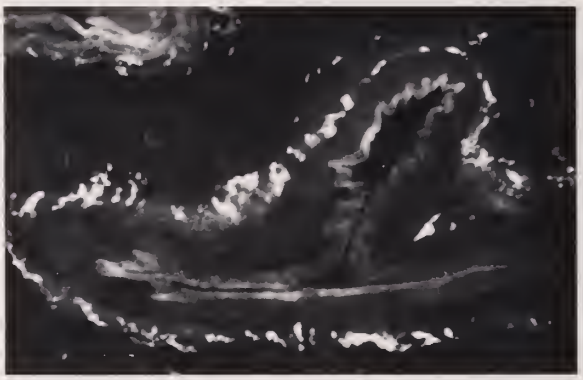

Fig. 4. Neural plexus of adrenergic nerves in adventitia of coronary artery. Nerves appear white at periphery. (x 400)

adventitia of the artery in question. Generally this degree of profusion of neural elements characterized all segments of the coronary arterial system. Centrally may be observed the non-specific fluorescence of the internal elastic membrane located adjacent the lumen. On the whole the neural plexuses described were confined primarily to the adventitia.

Parasympathetic elements, particularly terminal ganglia were found in contiguous locations and identified by diminished or complete lack of fluorescence. The neuroregulatory control of the coronary arterial system in terms of adrenergic representation can be regarded as formidable. As a result of the rich profusion of adrenergic fibers in the wall of the coronary arteries there is urgent need to completely reassess the role of sympathetic control of the coronary circulation in the light of these findings.

Whole mounts of pial vessels from the rat and rabbit brain were studied to determine the presence of neural elements. In all cases studied (Fig. 5), adventitial neural networks were demonstrated. These networks consisted of fluorescent positive adrenergic fibers lying bathed in amorphous catecholamine or transmitter substance. The neural networks described consisted of inter-anastomosing strands characterized by varicosities. Terminals were also detected in the form of beaded endings. The neural nets depicted completely surrounded the vessels studied and appear to be functionally concerned with vasoconstrictive phenomena. In addition, flooding of the vessel segments by transmitter substance may augment and facilitate the process.

Mast cells were also observed in some areas of the myocardium. This observation prompted a further study of mast cells in general. For this purpose membrane spreads of rat mesentery were procured. The contained mast cells were found predominantly deployed along mesenteric arteries. Compacted intra-cytoplasmic granules displayed an intrinsic autofluorescence after para-formaldehyde treatment. The autofluorescent granules consisted primarily of serotonin (5-Hydroxytryptamine). In addition, clusters of isolated mast cells were detected beyond arteriolar sites. Degranulation of mast cells occurred frequently as a result of preparation procedure. Reserpinization of experimental animals resulted in a markedly diminished fluorescence.

Fig. 5. Adrenergic plexus in adventitia or basilar artery. (x 400)

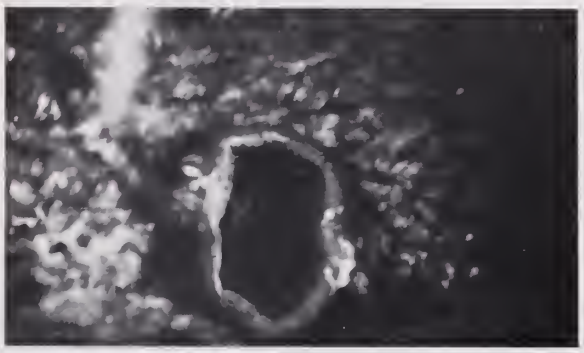

Fig. 6. Cross-section of coronary artery illustrating segmental innervation. (x 400)

Studies of innervation of coronary arteries are currently being continued. An experimental program of screening therapeutic drugs utilized in coronary artery disease is being contemplated as an extension of the limited results presented in this report. This technic is also being utilized to determine catecholamine changes following electrical stimulation of cardiac muscle. •

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Choroid plexus papilloma

An unusually large brain tumor

Adolf Rosenauer, MD, and
Albert F. Peterman, MD, Reno, Nevada

PAPILLOMA OF THE CHOROID PLEXUS has several characteristics setting it somewhat apart from the rest of the brain tumors:

1. It is very rare.
2. It can reach outside proportions.
3. It commands a domineering physiologic interest because of its position in the third circulation of the encephalon.

The relative rarity, type, preferential location, and sometimes conspicuous magnitude of this tumor has been recognized for some time. According to the principal brain tumor surveys,[1,2,3,4] one may expect the occurrence of a choroid plexus papilloma once in about two hundred assorted brain tumors. The growth may be situated anywhere along the plexus, in any ventricle. Instances are reported of invasion of the cerebral substance, as well as instances of controversy in the differential diagnosis of a submitted tumor specimen between ependymoma and choroid plexus papilloma. We believe that the tumor described here is a choroid plexus papilloma; however, one may readily appreciate the pathologist's dilemma in the above differential diagnosis.

CASE REPORT

In September, 1967, a three-year-old boy was admitted to Washoe Medical Center in Reno, Nevada, with a history of sudden frothy vomiting, followed by coma.

As an infant of three months, hydrocephalus had been recognized in this patient and a Pudenz type encephalo-cardiac shunt had been established. Apparently, it had been working satisfactorily until just prior to admission without symptoms of systemic infection. The parents had noticed occasional sleepy spells and instances of tremor, which were not particularly alarming.

The boy's examination revealed a head circumference of 55 cm. The Pudenz pump valve could be palpated easily in the vicinity of a healed scar behind the right ear, and it could be compressed easily. The refilling time originally was as long as one minute, but after activating the pump a number of times, it reduced to about 30 seconds, but never less than that. The patient kept his teeth clenched and would grit them quite often. There was no abnormality about the small incision in the right side of the neck. There were occasional purposeful movements of the extremities, such as scratching. The pupils were medium wide and without any light reaction. The optic discs were sharply outlined. Bilateral Babinski signs were noted.

An electroencephalogram was carried out, then a right carotid arteriogram, a ventriculogram using a limited amount of air, and a brain scan. The first test showed a strong spike focus in the right temporo-occipital area, the second and third showed a tumor blush in the right temporal region as well as evidence of considerable ventricular dilatation. The ventriculogram was done using the cranial end of the shunt tube as a route of air injection. It led to three essential points of information: The cerebral cortex was rather thin, there was an indentation of the otherwise huge air shadow in the temporal area, and the tube resisted withdrawal. When it finally was withdrawn, there was granulomatous tissue at its tip which had grown through the intake holes into the tube. Both the cranial tube and the valve pump were replaced by new parts which worked well when implanted. The granulomatous tissue proved to be choroid plexus with edema, hyperemia, chronic inflammatory changes and slight atypism of the covering epithelium. The brain scan was carried out after the Pudenz shunt had been put back into working

Fig. 1. Lateral radiologic view of tumor.

condition. It left very little doubt as to the presence of a mass lesion, its location corresponding to the area of the electroencephalographic lesion and the somewhat doubtful tumor blush on the arteriogram. A remote differential possibility of an obstructive lesion in the posterior fossa was discarded and the right cerebral hemisphere was explored.

There was a 93 gram tumor in the right side of a grossly dilated ventricular system. The brain itself did not bulge through the exposed dural incision, a sign of absence of generalized intracranial hypertension. The mass was found to have two major stalks, one to the choroid plexus of the third ventricle and another to the area of the glomus choroideum. The tumor bed was large enough to bring into vision the third ventricle through a grossly dilated foramen of Monroe, as well as a relatively vascular area in the opposite lateral ventricle which was interpreted as the choroid plexus or the area of the vena thalamostriata.

Although very little bleeding occurred during the exposure of the tumor, it was felt that the manipulation of the midline structures of the brain necessary to deliver the mass was more than one wished to see actually carried out. There were two brief spells of bradycardia during this part of the operation. The ventricular system was filled with saline before closure of the cranium. The boy woke up after surgery, and was able to blink his eyes, look around and move all limbs, although the left limbs moved less readily than the right. He died suddenly several hours after surgery in simultaneous circulatory and respiratory failure. Autopsy was not performed. The pathologic report was choroid plexus papilloma (Figs. 1 and 2).

Discussion

At times, the specimens may be quite large. Some published reports mention sizes of a man's fist, others mention diameters of 7.5 cm. (Fig. 3). Our specimen exceeded three ounces. In many instances, cyst formation is encountered with contents of such cysts varying considerably in color, viscosity, number and size. Rarely microscopic evidence of malignancy is noted.

Another characteristic of the choroid plexus papilloma is its demand for space by virtue of the volume of cerebrospinal fluid secreted. This abnormality of fluid secretion will be further discussed. The fundamentals were pointed out some time ago, perhaps

Fig. 2. Same, greater magnification.

Fig. 3. Gross specimen. Note size.

most candidly by D. Russell[5] in her thesis that cerebrospinal fluid production must equal absorption, and by W. Dandy's[6] observation in which he actually saw the exposed choroid plexus weep droplets of clear fluid. More recently, E. Kahn and J. Luros[7] showed convincingly that the choroid plexus papilloma does overproduce spinal fluid. It is not as easy at it may seem to logically prove this latter contention, even though hydrocephalus is so characteristically associated with this tumor that Olivecrona[8] emphasized this point in his part of the Handbook of Neurosurgery. He suggests the term "Peet syndrome" for the condition of coincidence of hydrocephalus and choroid plexus papilloma after an early description by M. Peet.[9]

In our case, the hydrocephalic aspect of the Peet syndrome had been controlled by the encephalo-cardiac shunt. There was no papilledema. It is possible, however, that this control was only partial. Prior to the replacement of the granulation-clogged, or tumor-clogged cranial end of the Pudenz shunt, it took almost a minute for the pump reservoir to fill, whereas after the replacement, it would fill within five seconds following digital compression. And since the tumor had not mechanically obstructed the circulation of spinal fluid, we were justified in expecting a "communicating" hydrocephalus, that is a shrinkage of the medulla cerebri. Actually, in enlargements of the head, the cortex cerebri finds itself in a somewhat fortuitous defense position against atrophy, as it may first straighten out its wrinkles without too much loss of volume, and then, as the skull continues to grow, yielding to slight but constant pressure, the volume of the peripheral layers increases substantially ahead of that of the more centrally located portions.

As an example, take a head circumference of 44 cm. and let it increase to 50 cm. This is a growth situation not unusual in a hydrocephalic within two or three months (our patient's head circumference was last measured at 55 cm.) If the disease would just be severe enough to arrest the growth of the brain but not actually shrink it, the mantle of the brain substance remaining at the end of the observation period would be expected to be slightly less than 2.5 cm. This means that the classification "atrophy" deserves great reservation, and furthermore, the observation of that sometimes remarkable intellectual performance of a hydrocephalic with a manifestly thin cerebral mantle may find part of its explanation as above. However, this consideration tells us nothing of why, in overproduction of cerebrospinal fluid from a choroid plexus papilloma or in any other instance of communicating hydrocephalus, the ventricles widen much more than the peripheral subarachnoid spaces, even though the fluid pressure of necessity has to be the same all throughout the inside of the skull. Such has to be postulated for the presented case as well.

Another interesting aspect of this case is the frustration of diagnosing a brain tumor in the absence of intracranial hypertension. This again weighs all the more heavily in the case of a cerebrospinal fluid secreting growth, since here, more than in many other instances, there is reason to employ all feasible methods of overcoming an obstruction in the cerebral fluid circulation. However, if blockage of the cerebrospinal fluid pathway is suspected, we obviously deprive ourselves of important information unless spinal fluid protein samples from different locations upstream and downstream of the block, or dye tracer distribution studies are employed. In our case, a decisive hint was provided by a radioactive uptake study with Technitium 99. The pictures show how avidly the tumor absorbs the diagnostic drug (Fig. 4). Of the

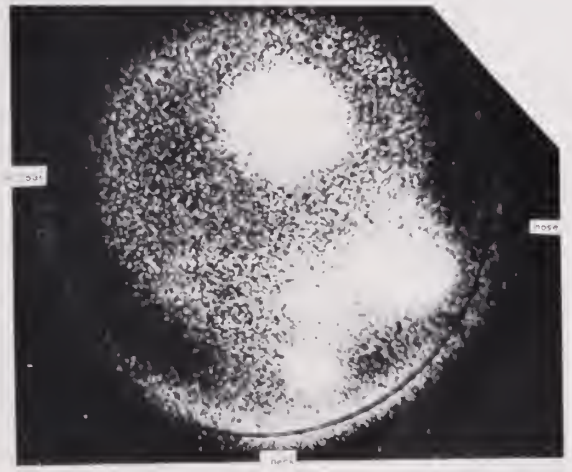

Fig. 4. Technitium 99 scan, right lateral. The uptake of the tumor (top central) is just as intense as that of the salivary gland complex.

various mechanisms of Technitium uptake, a break in the blood-brain barrier cannot be considered in this instance, as one would assume in any kind of localized cerebral trauma or primary inflammatory process. The concept of "affinity" to the element such as one might ascribe to random tumor cells, might fit the choroid plexus papilloma as well as whatever process leads to the excessive uptake by the salivary glands, because, after all, histologically and physiologically, the choroid plexus epithelium and the serous salivary gland cells have several features in common.

Summary

A case of hydrocephalus treated with a Pudenz type shunt, that later presented a choroid plexus papilloma of nearly 100 gms. is added to the literature. Some physiologic implications of the tumor activity are discussed. A rather pronounced uptake of Te 99 is emphasized. •

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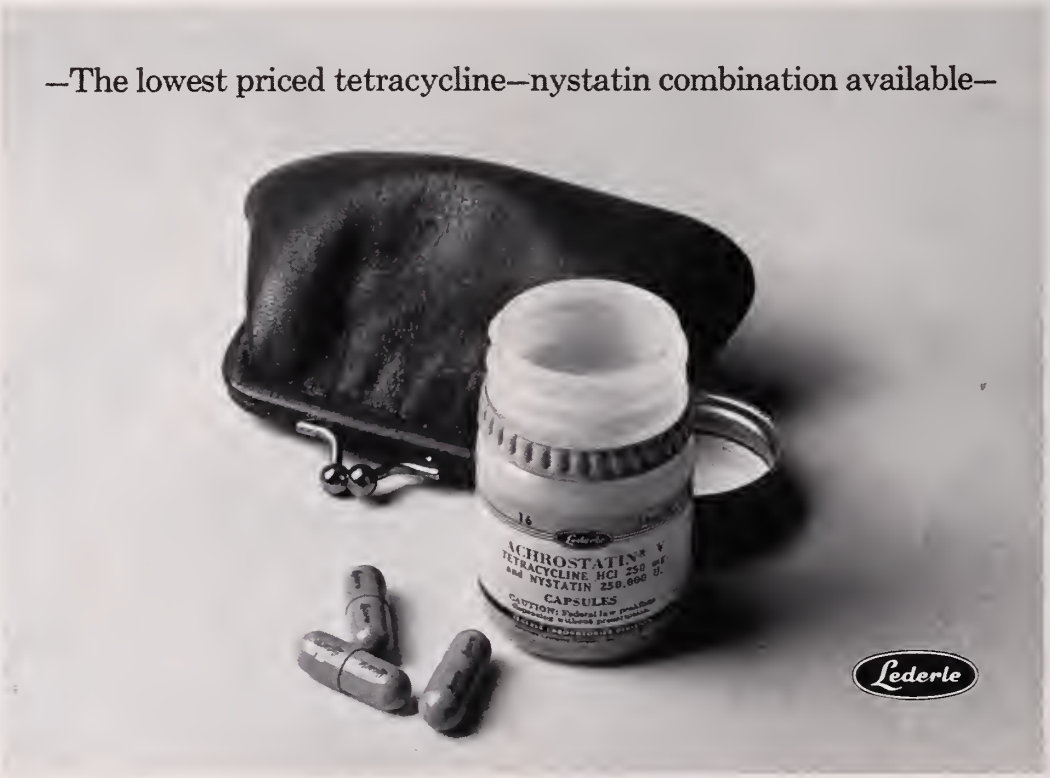

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Cytologic follow-up of carcinoma in situ after hysterectomy

Thomas E. Hall, MD,* Reno, Nevada

The diagnostic and therapeutic approach to this problem is relatively uniform in medical communities across the country. The question arises as to how the patient should be followed. Are additional and periodic Pap smears needed? There is surprising difference in medical practice on this point. These three cases from the author's cytology follow-up files may help resolve this question.

THE PERIODIC TAKING of vaginal cytologic smears has become an accepted part of routine medical care. Once a suspicious or positive smear is reported, little time is lost establishing a diagnosis, and, if carcinoma of the cervix is found, hysterectomy usually will be performed unless there are extenuating circumstances. When the uterus is examined by the pathologist he will generally find little or no residual carcinoma. Theoretically this should result in a 100 per cent incidence of cure.

CASE REPORTS

Case 1: A 36-year-old woman had a Class IV cytology smear in 1964. A cervical cone contained carcinoma in situ. Two months later she had a hysterectomy. No vaginal cuff was taken and no residual carcinoma was present. The first follow-up cytology smear was in 1969 and was reported as Class IV. Two of seven punch biopsies of the vaginal wall showed carcinoma in situ. One month later a 3 x 2.5 x 1 cm. segment of vaginal mucosa was removed from the area of the positive biopsies. This contained additional carcinoma in situ which extended to the line of excision in one area. Subsequently, additional vaginal mucosa was removed which was free of residual carcinoma. Hopefully she is now cured, but she should be followed by additional Pap smears.

Case 2: In 1964 a woman at age 38 had an abnormal cytology smear, followed by a conization which revealed carcinoma in situ. Hysterectomy was performed. No residual carcinoma was seen. One year later the patient had a Class IV Pap smear, and over the next six months had several Class III and IV cytology smears with negative punch biopsies of the vaginal wall. Approximately eighteen months post-hysterectomy, after iodine staining of the vaginal vault, a 2.7 x 2 x 0.9 cm. segment of vaginal mucosa was removed and revealed marked dyskeratosis, having some, but not all, of the characteristics of carcinoma in situ. Following this she had several more Class III smears. Since then additional biopsies have been taken, following which her Pap smears have reverted to negative. This case differs from the first in that the patient did not develop frank malignancy of the vaginal vault following her hysterectomy, but rather had a severe dysplasia bordering on carcinoma in situ, and hopefully has been cured by surgery and multiple biopsies.

Case 3: A woman who had a hysterectomy twenty years ago, presumbly for a benign condition, had been well in the interim. A cytology smear was taken in 1968 at age 56, for hormone evaluation, and was Class III. A repeat smear was Class IV. A vaginal biopsy revealed carcinoma in situ in one of five segments of tissue. A vaginectomy specimen, from operation one month later, showed marked focal atypia. Subsequent cytology smear was negative.

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Discussion

What is the significance of these case histories? First, let me emphasize that while carcinoma of the vaginal vault is an extremely rare condition, carcinoma of the vagina among women who have had a carcinoma in situ of the cervix is not rare. While it may be estimated that only one in 2,000 or 4,000 women will develop a carcinoma of the vagina,[1] among women who have had a hysterectomy for carcinoma in situ of the uterine cervix the incidence quoted in the literature varies from 0.7 per cent to 6.6 per cent.[2] We have been doing a follow-up study on our cytology files since June, 1964, encompassing 208 cases of carcinoma of the cervix. If the second case presented above (dysplasia bordering on carcinoma) is included as a significant find, our yield is approximately 1 per cent in four and one-half years. Let me stress that unfortunately many of these 208 cases have *not* had the benefit of follow-up cytology smears. I have no accurate estimate of what the actual yield would be if all these women had follow-up cytology smears.

Two possibilities have been brought forward to explain the high incidence of vaginal malignancy following carcinoma in situ of the cervix. The first is that the initial surgery, although apparently adequate, was not actually complete. Although in situ carcinoma is usually confined to the vicinity of the external os, a number of studies[3] have demonstrated instances of irregular distribution over the exocervix and even onto the adjacent fornix. The surgeon must be aware of this and, I believe, should either routinely submit a generous cuff of vaginal mucosa around the cervix, or should carefully check the cervix by Schiller iodine staining and be sure that all abnormal-appearing areas are adequately removed with a margin of normal tissue. The pathologist, for his part, must do more than make a few cursory sections through the exocervix. The cervix must be entirely sectioned and the margins identified and evaluated.

A second possible explanation is that of the "field" theory. The uterine cervix is an area which is prone to develop carcinoma and in a certain per cent of women, (whether it be exposure to a carcinogen, due to heredity, or whatever), this tendency manifests itself and a carcinoma of the cervix develops. If the cervix is surgically removed, a similar but more resistant tissue, the vaginal mucosa, continues to be exposed to the same malign influence(s), and in certain per cent of cases this influence will result in a vaginal carcinoma. This occurrence was not appreciated in the past because many of these women would die of their cervical carcinoma before the hypothetical vaginal carcinoma could develop, and it is only since they are living out their normal life span that we now see carcinoma develop in a relatively more resistant tissue in the same "field."

Conclusion

At the time of hysterectomy for carcinoma in situ of the cervix either a vaginal cuff should be routinely taken or a Schiller stain should be made of the cervix. The pathologist must identify and thoroughly evaluate the surgical margins. Patients having hysterectomy for carcinoma in situ of the uterine cervix must be followed by routine periodic Pap smears, perhaps six months postoperative and then at regular intervals. As a group they stand an equal or greater chance of developing carcinoma of the vaginal mucosa than the average woman does of developing carcinoma in situ of the uterine cervix.

Summary

Three cases of abnormal vaginal cytology following hysterectomy are presented: carcinoma in situ of the uterine cervix with hysterectomy followed by carcinoma in situ of vaginal mucosa; carcinoma in situ of the uterine cervix with hysterectomy followed by severe dysplasia of the vaginal mucosa; and hysterectomy for a non-malignant condition followed twenty years later by carcinoma in situ of the vaginal vault. The importance of the cytologic follow-up for carcinoma in situ after hysterectomy is stressed. •

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Tuberculosis and other mycobacterial infections

A survey in Clark County school children

Richard J. Browning, MD,* Las Vegas, Nevada

Tuberculosis or not? This important survey attempts to answer this question.

DESPITE A NATIONWIDE EFFORT to irradicate tuberculosis, 47,000 *new* cases were reported in the United States in 1966. Eight thousand persons died of tuberculosis that year. Twenty per cent of the new cases occurred in persons less than fifteen years old. Two per cent (188) of the newly reported childhood cases were fatal.[1]

In 1966, Nevada experienced a new active case rate of tuberculosis, more than twice the national average, ranking third to District of Columbia and Alaska. In the age group five to fourteen years, Nevada ranked number one with an incidence more than twice that of the second-ranking state. (See Table 1.)

In recent years, the problem[1] of cross-antigenicity resulting from previous infection with atypical or unclassified Mycobacteria has been emphasized.[2] Persons previously infected with the so-called atypical or anonymous non-tuberculosis acid-fast Mycobacteria will demonstrate a positive reaction to old tuberculin (OT) or purified protein derivative (PPD). These reactions are frequently of a less intense degree than those due to tuberculosis. An outgrowth of this discovery has been the development of a number of antigens derived from atypical Mycobacteria, not Mycobacterium tuberculosis. Several of the studies mentioned have identified an approximate incidence of atypical acid-fast infections in various areas of the country. No such statistical data is available for Nevada.

The current study was accomplished in 1968 in an attempt to answer some of the questions posed by the aforementioned data. By undertaking this study, we hoped to answer several questions: (1) Is the incidence of tuberculosis in first grade school children of Clark County inordinately high when compared with the national case rate? (2) Is there a significant incidence of endemic or indigenous atypical acid-fast infection in Clark County, Nevada? (3) Is it possible that our criteria for the diagnosis of primary tuberculosis, particularly the interpretation of tuberculin skin tests, should be re-evaluated and brought up to date? In addition, the study represented an extension of the tuberculosis control program which afforded us an opportunity for case findings, contact investigation, and treatment of childhood tuberculosis.

Materials and Methods

Heaf tests, utilizing the Sterneedle (purchased from the Panray Company), were administered on a screening basis. Sterneedle reactors of any intensity were subsequently tested with PPD-Standard (PPD-S) and PPD-Battery (PPD-B), both of which were

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obtained from the Communicable Disease Center, Atlanta, Georgia. The Sterneedle tines were immersed in the PPD Connaught solution and administered on the volar aspect of the forearm. These tests were given on site at the schools by a group of Public Health Nurses. The same Public Health Nurses interpreted the reaction of the test at the school at the end of seven days. Subsequent Mantoux testing was done in the Chest Clinic of the Clark County District Health Department utilizing a standard intracutaneous injection of 0.1 cc. of PPD-S and PPD-B on either forearm. The Mantoux tests were read in the clinic at 48 hours by the nursing staff.

The reactions were measured precisely in millimeters. At the time of the Mantoux testing, the Public Health Nurses obtained a history of: Illness in the child; tuberculosis in the family; exposure to tuberculosis; BCG vaccination; results of previous tuberculin skin tests; ingestion of raw milk.

Children with positive or borderline Mantoux reactions were subsequently seen by a physician in the Chest Clinic where they underwent history and physical examination. Standard 14 x 17 x-rays were performed and interpreted independently by a radiologist.

Observations

Five thousand nine hundred thirty-three (5,933) first graders were enrolled in the schools tested. Four thousand thirty-five (4,035) received the Heaf test and 178 reacted positively. (Tables 2 and 3).

It should be pointed out that 32 per cent of the entire enrollment was not tested due to lack of parental consent or absence from school. Absence was high at the time of this study principally due to upper respiratory infections. Nevada has no law providing general consent for such medical measures, hence each child's parent must return a signed permit. The students and parents did not know in advance the date of the testing or interpretation. Ninety-four per cent of administered tests were interpreted. (Table 2).

One hundred seventy eight (100 per cent) of the Sterneedle reactors underwent subsequent Mantoux testing with PPD-S and PPD-B. Based upon their reaction to PPD-S, these children were placed in categories arbitrarily designated "negative," "borderline," and "positive." "Negative" was defined as skin induration of zero to five millimeters; "borderline" as six to eleven millimeters; and "positive" as twelve millimeters or greater. Table 4 provides a breakdown of the PPD-S reactions.

The "negative" PPD-S group underwent simultaneous skin testing with atypical Mycobacterial antigen (PPD-B). These results are shown in Table 5. The 29 PPD-B "reactors" were not further tested, but regarded as examples of probable previous atypical Mycobacterial infection.

These "negative" PPD-S reactors (0 to 5 mm.) constituted 84 per cent of all the original Heaf reactors. Eighty per cent of these reactions were precisely zero millimeters. Eighty-one per cent of these "negative" PPD-S reactors also reacted negatively (0 to 5 mm.) to PPD-B. In fact, 87 per cent were precisely zero millimeters. Thus, 73 per cent of the original Heaf reactors were ultimately regarded as "false Positive."

Seven children produced a PPD-S reaction of 12 milimeters of induration or greater. None of these had PPD-B reactions as great as 12 millimeters. Three PPD-B reactions were between zero and five, whereas four were from six to eleven millimeters. These seven students were regarded as "tuberculin reactors."

The "borderline" PPD-S group proved more difficult to analyze and for this reason were retested at six to twelve weeks interval with both PPD-S and PPD-B. Table 6 outlines the results.

One of these children had an initial PPD-S of 8 mm. and a PPD-B of zero mm. Due to the presence of a significant family history of tuberculosis, this child was regarded as a tuberculin reactor and no further studies were done. Another child in the "borderline" group had a PPD-S of 6 mm. and a PPD-B of 8 mm. Upon retesting the values were PPD-S of 10 mm. and PPD-B of 15 mm. He was regarded as a case of atypical Mycobacterial infection, but received INH prophylaxis based on the possibility of combined infection. A third child had an

especially interesting clinical history which is detailed in a case report. Thus, the "borderline" group was ultimately determined to contain two true tuberculin reactors, four with atypical Mycobacterial infection and seven false positive Heaf reactors.

CASE REPORT

L. G., seven-year-old Cuban girl originally had a grade one Sterneedle reaction. On subsequent differential skin testing, February 26, 1968, we found a PPD-S reaction of 7 millimeters and a PPD-B reaction of 8 millimeters. Subsequent skin testing on April 19, 1968 revealed a remarkable change with the finding of a PPD-S reaction of 18 millimeters and a PPD-B of zero. At this point, the patient was being approached by another direction as a result of having been reported as a contact. Further history disclosed she had been in close contact with an uncle with open cavitary tuberculosis now in his third relapse after previous satisfactory in-patient and out-patient treatment in Miami, Florida. The child's history revealed slight fatigue and a cough for two weeks. Clinical examination was negative aside from a grade two systolic heart murmur at the base. She previously had been studied in Florida and was thought to have congenital heart disease, possibly mild subaortic stenosis. Chest x-ray was negative except for small peri-hilar calcifications. Two gastric secretions were negative on culture for tubercule bacilli. The child was treated as an out-patient with INH and PAS to which her uncle's organisms were sensitive. She has done well.

Clinical and radiographic examination of the nine tuberculin reactors produced the following findings: Four of the nine were either of Mexican or South American origin. Two were known to be recent converters. Five had a positive family history of tuberculosis. One had linear parenchymal scarring and hilar calcifications. Four others had hilar calcifications. No instances of acutely enlarged hilar lymph nodes was noted. All nine of these children have been placed on chemotherapy. One additional Heaf "reactor" was discovered who had received previous BCG vaccine. Table 7 outlines the overall results of the survey.

Discussion

Of 3,801 first graders tested and interpreted, 179 (4.7 per cent) produced a positive Heaf (Sterneedle test) of grade one or stronger reaction. It was necessary to perform additional studies on all group one Sterneedle reactors because some of the grade one reactors were truly tuberculin positive. On the other hand, all of the grade three and grade four Sterneedle reactions were true tuberculin reactors. Differential skin testing with PPD-S and PPD-B in conjuction with clinical examination and x-ray examination disclosed a total of nine true tuberculin reactors in the original group of 3,801 for an incidence of 0.24 per cent. An additional 33 cases of probable previous infection with atypical Mycobacteria were discovered for an incidence of 0.9 per cent. One child had received BCG. The remaining 136 represent a false positive Sterneedle reaction.

Evaluating the Sterneedle test as a screening agent disclosed that this screening test eliminated 95.3 per cent of the original population from requiring additional study. This is assuming that there are no false negatives which is actually unknown in this particular study, however, other investigators have suggested that this method produces less than 3 per cent false negatives. Further examination of the group suspected to be positive on the basis of the screening tests discloses 76 per cent of these are false positive. Five per cent of those with positive Sterneedle reactions were true tuberculin reactors based on the results of the differential skin testing. Nineteen per cent were reacting as a manifestation of previous infection with atypical Mycobacteria.

A tuberculin reactor rate of 0.24 per cent in a first grade population is not considered high and, indeed, is somewhat lower than many metropolitan areas.[3] The atypical Mycobacterial infection rate of 0.9 per cent has definite clinical significance. On the basis of this study, previous infection with atypical non-tuberculous Mycobacterial organisms is three to four times more common than tuberculosis in Clark County first graders. This study suggests that Las Vegas and Clark County, Nevada do not have a tuberculin reaction rate in first grade school children as high as anticipated by Nevada's number one rank in the nation.

In the past, many cases of "active primary tuberculosis" have been diagnosed in Clark County based on the criteria of an intermediate PPD reaction of 5 millimeters or greater combined with minimal or borderline non-specific abnormalities on the chest film. This study suggests that utilizing 5

millimeters or greater as a criterion for a positive tuberculin test could lead to substantial overdiagnosis of tuberculosis. The majority of these children with PPD intermediate reactions of 5 millimeters or greater are either false positives or cases of atypical Mycobacterial infection. Obviously, it is time to up-date our interpretation of the tuberculin test.

Appropriate Isoniazid prophylaxis and treatment is extremely important in children who are tuberculin positive. This study does not jeopardize the free use of such therapy, but rather attempts to emphasize the importance of accurate diagnosis regarding etiology and activity. With this in mind, the following clinical approach is suggested:

Active Primary Tuberculosis: This diagnosis should be made in a child who has positive bacteriological studies for Mycobacterium tuberculosis, or in a child with clinical illness, positive tuberculin test, and abnormal chest x-ray combined with a significant history of exposure to tuberculosis. This child should be treated with multiple drug therapy preferably in a hospital.

Tuberculosis Contact: This category refers to a child who is a household contact of an active case of tuberculosis or who has had a significant non-household contact of an active case. Appropriate chemotherapy is necessary in this instance *regardless of the skin test reaction,* although the child should be skin tested immediately and subsequently on repeated occasions if negative.

Tuberculin Converter: This diagnosis should be rendered in any child under age four with a positive tuberculin test or anyone who has a positive skin test and is known to have had a negative tuberculin test within two years. Chemotherapy is mandatory in this instance.

Tuberculin Reactor: This category would include all children with intermediate strength PPD Mantoux reactions of 12 millimeters or greater. If the PPD reaction is 6 to 11 millimeters, differential skin testing with PPD-S and PPD-B should be accomplished. If the PPD-S reaction is again 6 to 11 millimeters and greater than 1 millimeter larger than PPD-B reaction, the child should be regarded "tuberculin reactor." If the PPD-S reaction is again 6 to 11 millimeters and the PPD reaction is smaller by 1 millimeter or more, the results should be regarded as "doubtful." It is recommended that both the PPD-S and the PPD-B be repeated in six to twelve weeks in this circumstance. Tuberculin reactors under age 18 should receive Isoniazid chemotherapy. Some authorities feel tuberculin reactors of all ages should be treated.

"Negative Reactors": PPD intermediate reactions of 5 millimeters or less should be regarded as a negative reaction. It is important to emphasize, however, that 3 per cent of active tuberculosis occurs in the presence of a negative tuberculin skin test. Here, as in all circumstances, the history and other pertinent clinical information is of greater importance than the skin test. Tuberculin tests stronger than intermediate strength may occasionally be helpful. Bacteriological studies, when available, are more important than the skin tests.

Summary

Four thousand thirty-five (4,035) first grade school children in Clark County, Nevada underwent tuberculin screening (Sterneedle). Although 4.7 per cent reacted positively to the Heaf test, considerable additional analysis was necessary to detect true tuberculin reactors. This was accomplished by subsequent differential skin testing using tuberculin (PPD-S) and atypical Mycobacterial (PPD-B) antigens. Clinical examinations and chest roentgenograms were performed. Seventy-six per cent of the Heaf reactors were false positive; 19 per cent were due to previous infection with atypical Mycobacterium; only 5 per cent were true tuberculin reactors. Only 0.24 per cent of first grade school children in Clark County, Nevada are tuberculin reactors. This rate is considerably smaller than anticipated in view of Nevada's tuberculosis rate in school children, which is highest in the nation. An incidence of previous infection with atypical Mycobacterium three times that of tuberculosis was previously not recognized for this area. Nine tuberculin reactors were identified and treated.

TABLE 1

NEW ACTIVE TUBERCULOSIS CASE RATES—1966

	ALL AGES	*UNDER 5*	*5 TO 14*
UNITED STATES	24.4	12.9	7.7
NEVADA	53.6	29.6	96.9
ALASKA	55.5	29.3	34.3
DISTRICT OF COLUMBIA	68.6	84.2	42.3
ARIZONA	31.4	15.8	7.2

TABLE 2

RESULTS OF HEAF TESTS

TOTAL ENROLLMENT	5,933
TESTS ADMINISTERED	4,035
TESTS INTERPRETED	3,081
TESTS POSITIVE	178

TABLE 3

INTENSITY OF HEAF REACTION

GRADE I	166
GRADE II	8
GARDE III	3
GRADE IV	1
TOTAL	178

TABLE 4*

PPD-S REACTIONS IN HEAF REACTORS

"NEGATIVE" (0 to 5 mm. induration)	157
"BORDERLINE" (6 to 11 mm. induration)	13
"POSITIVE" (12 mm. or greater induration)	7
TOTAL	177

*Note: One Heaf reactor had previously received BCG vaccination so was not tested to PPD-S.

TABLE 5

ATYPICAL MYCOBACTERIAL SKIN TEST RESULTS IN PPD-S "NEGATIVE" (0-5 MM) GROUP

PPD-B "NON-REACTOR" (zero to 5 mm. induration)	128
PPD-B "REACTOR" (6 mm. or greater induration)	29

TABLE 6

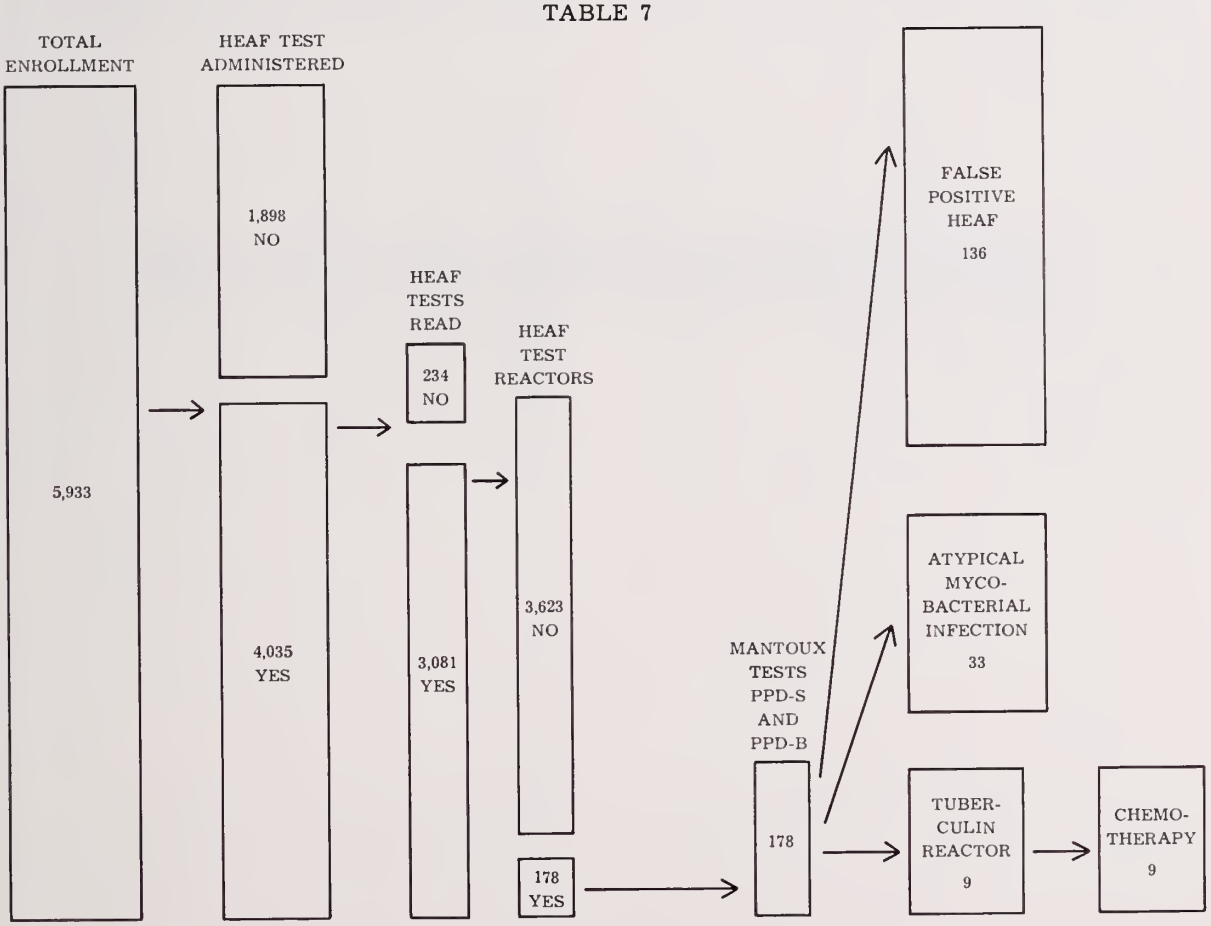
PPD-B REACTIONS IN "BORDERLINE" (6-11 mm.) PPD-S REACTORS

Group 1 PPD-B reaction 0 to 5 mm.		5
Group 2 PPD-B reaction 6 to 11 mm.		5
Group 3 PPD-B reaction 12 mm. or greater		3
TOTAL		13

Results of retest at 6 to 12 weeks:

		PPD-S	PPD-B
Group 1	0 to 5 mm.	4	4
(one not retested)	6 to 11 mm.	0	0
	12 mm. or greater	0	0
	0 to 5 mm.	3	3
Group 2	6 to 11 mm.	2	1
	12 mm. or greater	0	1
	0 to 5 mm.	3	0
Group 3	6 to 11 mm.	0	0
	12 mm. or greater	0	3

TABLE 7



Conclusions

1. 4.7 per cent of 3,801 first grade school children in Clark County, Nevada reacted positively to screening Heaf tests (Sterneedle). Seventy-six per cent of these reactions were false positives; 19 per cent were due to previous infection with atypical Mycobacteria; 5 per cent were true tuberculin reactors. These results were based on differential skin tests with tuberculin and atypical Mycobacterial antigens combined with clinical and x-ray examination.

2. Nine tuberculin reactors were identified and treated.

3. Only 0.24 per cent of first grade school children in Clark County, Nevada are tuberculin reactors. This rate was considerably smaller than anticipated in view of Nevada's new case rate of tuberculosis in children 14 years or younger which is the highest in the nation.

4. The incidence of previous infection first grade school children in Clark County, Nevada is at least three times as high as tuberculosis. This is of considerable interest since the previous incidence was not known.

5. Re-evaluation of the criteria for a positive tuberculin test is suggested to avoid confusing the diagnosis of previous atypical Mycobacterial infection with that of tuberculosis.

6. Suggestions for interpretation of tuberculin tests and utilization of differential skin tests are included.

7. The results of this study should in no way deny appropriate chemotherapy and Isoniazid chemoprophylaxis for tuberculin reactors and cases of active primary tuberculosis.

ACKNOWLEDGMENTS

I wish to thank Otto Ravenholt, MD, Clark County District Health Officer whose staff performed the skin tests, assisted in the clinical examination of the children, and helped tabulate statistical data.

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Intracervical vs. Paracervical block

Robert L. Stewart, MD*, Reno, Nevada

A narrative account of the development of an additional method of pain control in delivery.

In the fall of 1950, two medical students, after watching a resident obstetrics do a pudendal block, asked this resident why he didn't introduce the needle approximately two centimeters further within the vagina to enter Alcock's canal and catch the pudendal nerve before it branched. The answer was rather blunt, "I don't know, but if it were possible somebody else would have done it a long time ago." The next day they asked another resident the same question. He looked at them and asked, "Are you sure of your anatomy?" Having just finished a special refresher course of female anatomy, they pointed out that one could catch the nerves with one injection before they branch, thus eliminating the need to infiltrate around the clitoris and over the perineum, by going approximately two centimeters further up inside and catching the nerve in Alcock's canal. Ed Klink's answer was different than that of the other resident. "I don't know the answer now, but I'll bet a year from now I do."

A year later in Chicago at the AMA meeting, Dr. Ed Klink was demonstrating a new form of pudendal block. He had disected out over 50 cadavers and proved that the anatomy that the two medical students had indicated to him was true. He also had developed a technic of reaching those nerves, and by using approximately half the amount of local anesthesia that had been used previously he was able to get more profound anesthesia with his pudendal block. This new pudendal block opened up a new field in obstetrical anesthesia because it became obvious that if you could reach it through the buttocks you could also reach it through the vagina.

The next time I saw Ed Klink was at the American College of OB-GYN national meeting in 1960. He was demonstrating a new pudendal block approach, using an Iowa Trumpet guide and putting it through the vagina. His technic was very accurate, and required no more than 8.0 cc of solution on each side. Approximately at the same time others were starting to investigate the possibility of injecting around the cervix and producing adequate anesthesia for contractions prior to giving the pudendal block. These investigators found that being already in the vagina to do the pudendal block they could also inject the cervix and give the patient much greater relief of pain. This technic developed into what was known as the paracervical block—infiltration outside of the cervix blocks the nerves as they come into the cervix and thus deadens the pain of the contractions.

Approximately 1962, at a convention of the American College of OB-GYN, I saw a film that demonstrated this technic. As I watched the film there was one thing that bothered me. This was the possibility of putting the needle through the cervix and thus possibly entering the fetal skull. However, I

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was determined to try the technic. The first time I tried it, as luck would have it, I ended up with a dead baby. This shook me up rather thoroughly. I searched the baby carefully for a needle hole in the scalp anyplace, and could not find one. Autopsy did not reveal anything, and no definite cause of death was found. This possibility still bothered me. It was obvious that if the needle went through the cervix into the baby's head, if it hit bone there would be very little trouble, as this would be obvious to the person injecting it. But knowing the anatomy of the pelvis, the position of the head usually at this part of labor, it would be very possible to have a fontanel directly behind that cervix, and there would be the possibility of injecting directly into the baby's brain or into a suture line somewhere into the baby's head. Then I realized that it was possible to keep your finger between the needle and the baby's head, and thus completely eliminate this danger. The more I thought about it, the more I came to the conclusion it actually could be done easier than the paracervical block that I had seen demonstrated and written up in the literature, because all it would require would be to slip the finger between the guide and the baby's head. Also when the needle went in, it would be aimed laterally rather than medially toward the head. There would be no chance of touching the baby with that needle. There would be no possibility of injury in case of a placenta previa or a low lying placenta because anesthesia would be given when the patient was well on her way in dilitation (in most cases after five centimeters of dilitation) by which time placenta previa or a low lying placenta would probably be obvious. Even an adjacent placenta were slightly damaged while inserting the needle, it would not be difficult to rupture the membranes allowing the head to come down against the placenta and stop the bleeding.

Consequently, I developed a technic of inserting my finger inside the cervix with the Iowa Trumpet guide and then sliding a number 20 needle down the guide and into the cervix. The guide was usually set at about 3:30 o'clock on the left side and about 8:30 o'clock on the right. The needle was inserted through the guide and into the cervix approximately 1.0 centimeter, never more than 1.5 centimeter. As a rule, no more than 5.0 cc of 1 per cent xylocaine or 1 per cent carbocaine was given. Xylocaine was given usually when the patient was more than 7 centimeters dilated, inasmuch as its action is much faster, and of shorter duration. Carbocaine was used in the cases mainly between 5 and 7 centimeters, and thus was used in by far the majority of the cases that we had. The problems that have arisen with the use of the pudendal and paracervical blocks getting into blood vessels can be easily controlled by simply removing the needle after aspiration of blood and replacing it so that you are not in a vessel at the time of injection.

In the literature, paracervical block has been reported to cause a decrease in the fetal heart rate, and twice carbocaine has been implicated as a possible cause of death associated with the slowing of the fetal heart rate. In cases that have delivered relatively fast after rupture of the membranes I have not checked fetal heart tones inasmuch as the time limit would not have indicated anything. However in those cases, where it took a relatively long time before delivery, I have had the fetal heart tones checked. At no time with this technic have the fetal heart rates been less than 120 per minute, thus indicating that we have not experienced any slowing of the fetal heart rate with this type of anesthesia. This makes me wonder if the cases on record of slowing heart rate and possible death could not have been due to the one thing that made me develop this technic, that is the actual insertion of the needle into the fetal head and injection into the fetus itself.

We have not experienced any reaction to any drugs, probably because we have questioned the patients ourselves and we know whether they are allergic to any of the caine drugs. The possibility of getting into a blood vessel and causing a hematoma has not been experienced.

Thus the only problem that we have experienced has been that associated with timing for anesthesia. As everybody knows, in watching the patient in labor, it is not

always possible to get perfect timing. Thus sometimes we were a little bit late, and occasionally a little bit early. It was in the early cases that I found a few cases that I did not get perfect anesthesia the first time and sometimes had to inject a second time. I learned that if you were giving anesthesia to a patient who is 4 or 5 centimeters dilated you had to insert the guide farther up inside the cervix than you did for those who were 7 to 8 centimeters. It was thus simply a matter of learning the approximate depth to put the guide prior to the insertion of the needle. As for the ease of administration, I found this to be a great deal easier to insert than the usual paracervical block because it did not require going on the outside of the cervix and working your way around the head in order to get into the right position. Also, it is less uncomfortable for the patient because it is not so difficult forcing your way around the head, and also because injection directly into the cervix was painless. I even found that this could be done on primiparous patients, and several patients who did not want saddle blocks were given this type of anesthesia with excellent results.

As for effectiveness, my partner, Dr. Bynum, and I have done a total of 1,306 cases. As Dr. Bynum was not keeping a record to my knowledge, I have eliminated his cases from my calculations, but I do know that he has had excellent results and considers it an excellent form of anesthesia. Approximately 914 of these cases were performed by me. I listed them as excellent, good, fair, or poor. Those that were listed as excellent were the ones who had such complete relief of discomfort they had to actually be told when they were having a contraction. Those rated as good are the ones that stated that they could feel a contraction, but it was not anywhere near as hard as before and they felt quite comfortable. Those listed as fair were the ones having enough discomfort that they could tell us when every contraction occurred and occasionally could tell us that most of their pain was on one side or the other. Poor was reserved for those who literally had no relief of pain, and there were actually none of these. It should be realized that these were always combined with the pudendal block and consequently some of the cases that were listed as good or fair might have been listed farther up if the paracervical alone was considered. As with most pudendal blocks during delivery, the last one or two contractions prior to delivery will usually have a considerable amount of pressure against the rectum. Some people will consider this relatively uncomfortable; others will complain very little. Thus if the head was down rather low some of the patients would be rated as good simply because when we asked them if they could feel a contraction they would say yes. Also some of those that at first might have been rated as fair because they could feel a contraction on one side were good or excellent after reinjection on that one side, but were still included in the fair group.

Of the 914 that I injected, 761 or 83.3 per cent were listed as excellent, 127 were listed as good making 13.9 per cent, and 25 or 2.8 per cent were listed as fair. There were no poors in the group.

As for the uses of this technic compared with the paracervical block, the intracervical block has limited indications. It can be used only in pregnancy that is at or near term and after the cervix has been dilated a considerable amount. It is easier to administer than the paracervical block, and faster for administration. It is also less uncomfortable for the patient. And, at least in my hands, I feel it is a great deal safer and more accurate than the paracervical block. The paracervical, on the other hand, has the advantages that it can be used earlier in pregnancy for an abortion, and it can be used for endometrial biopsies, for removing intrauterine devices, or any other manipulation in the early pregnant or nonpregnant uterus.

Summary

I consider intracervical block an effective, fast, and accurate method of giving the patient adequate relief during the last stages of labor. Combined with the pudendal block it makes delivery very comfortable, and very satisfactory for most patients. In fact, the majority of patients who have had pervious deliveries with different types of anesthesia have indicated that they preferred this

method to anything they had had before. It can be used wherever a fetus might be endangered, and an adequate fast anesthesia is needed. I do not believe that it has endangered the fetus at any time, and no evidence of slowing the fetal heart tones has ever been found. In all cases where the fetus had any difficulty breathing immediately after delivery other causes than the paracervical were noted. In our hands it is a very safe, effective, efficient method of relieving pain for the last stages of labor and, combined with the pudendal block, for the delivery. •

Bullet appendicitis*

William B. Rydell, Jr., MD, Las Vegas, Nevada

A new form of lead poisoning.

Acute obstructive appendicitis caused by ingested foreign bodies has been reported,[1] but its incidence is considered to be quite rare. Sharp, pointed foreign objects have more frequently caused acute inflammation by penetrating the wall of the appendix.[2-4] In addition, incidental foreign bodies of an amazing variety have been found in the appendix.[5-7] In Collins' monumental study of 50,000 appendices, foreign bodies, other than fecoliths, were present in one per cent of the appendices.[5] The majority of these were metallic, but with the exception of 110 instances of lead shot, no bullets were encountered. Friedman and MacKenzie[8] reported a case in which an ingested .22 calibre bullet was found in an otherwise normal appendix. No other reports of a bullet in the appendix could be found in the literature. The following case is believed to be the first reported patient with acute obstructive appendicitis caused by an ingested bullet.

*From the Surgical Staff of the Southern Nevada Memorial Hospital, Las Vegas, Nevada.

CASE REPORT

An 11-year-old boy was admitted to Southern Nevada Memorial Hospital on January 18, 1969, because of vomiting of three-day duration. Abdominal distension and obstipation developed on the day of admission. He complained of minimal generalized abdominal pain. Examination revealed an acutely ill boy who showed evidence of dehydration. His rectal temperature was 39.6°C. and his pulse 140 per minute. The abdomen was moderately distended and only slightly tender. No rebound tenderness was present. Bowel sounds

were diminished and high-pitched. His hematocrit was 49 per cent and the white blood count 8,500 per ml. with 4 juvenile cells, 13 segmented neutrophils, 52 band cells and 31 lymphocytes. Serum sodium was 125 mEq/liter, potassium 3.3mEq/liter, chlorides 83 mEq/liter and carbon dioxide 34 mEq/liter. Abdominal films were interpreted as showing small bowel obstruction with an ingested .22 calibre bullet present in the lower abdomen. (Fig. 1.)

After correction of the fluid and electrolyte deficit, laparotomy was performed. Generalized peritonitis was found and 500 cc. of thick pus aspirated. Exploration in the pelvis revealed an adherent, perforated appendix. The easily palpable bullet was impacted 2 cm. from its base, obstructing the lumen. (Fig. 2.) Appendectomy was performed and the stump inverted. Intraperitoneal kanamycin and intravenous ampicillin were administered.

Initial improvement was followed by a series of serious septic complications. On the fourth postoperative day a wound abscess, yielding a pure culture of Escherichia coli, was drained. Profuse bile stained drainage from the upper portion of the wound began on January 29. Barium study on February 1 demonstrated a small bowel fistula dissecting under the fascia to drain superiorly. A large pelvic abscess was palpable per rectum.

Re-operation on the critically ill boy was performed on February 3. Sump drainage of the pelvic abscess via the lower abdominal wall was established. The adjacent 4 mm. hole in the ileum was simply sutured and the wound closed in one layer.

Fig. 1. Upright film of the abdomen showing air-fluid levels and the bullet in the pelvis.

Fig. 2. Roentgenogram of the removed appendix showing the bullet lodged in the proximal portion of the appendix.

His general condition improved following this, despite resumption of the fistulous drainage on February 6. Massive amounts of serum albumin and a high caloric diet were used to maintain nutrition. His weight had dropped from 100 pounds on admission to 74 pounds by February 12. On that date, spontaneous bowel movements began. Great reduction in the fistulous drainage occurred over the next several days, ceasing completely on February 23. Coincident with this was a dramatic improvement in his general condition. His temperature and pulse returned to normal levels and he again took an interest in his surroundings.

He was discharged from the hospital on February 25. Three weeks later the wound had healed and he had gained 20 pounds. When last seen on July 22, 1969, he was in robust health with no evidence of gastrointestinal disease or incisional hernia.

Comments

No history of swallowing the bullet could be obtained from the patient, but by the rusted casing and the fibrous reaction around the bullet, we presumed that it had been in the bowel for some time. It is probable that the bullet entered the appendix because of its weight and could not be expelled by the weak peristaltic action of that organ. When, due to the size of the bullet, the appendiceal lumen became obstructed, a condition favoring the development of acute appendicitis was present. The overall patho-physiology appears to be similar to that occurring when a fecolith is impacted in the appendix.

Although foreign bodies may lie dormant in the appendix for long periods of time, their presence often provokes an inflammatory response ranging from mild chronic irritation to acute perforated appendicitis. Sharp, pointed foreign bodies are more likely

to cause early penetration of the mucosa or frank perforation. Fredell[2] reported a perforated appendix in a closely followed infant eight days after a pin was swallowed. Weintrob and Granet[9] reported a penetration with near perforation four weeks following ingestion of a pin. Because of this proclivity, we agree with other authors[6,8] who recommended prophylactic appendectomy when foreign bodies are discovered in the appendix.

Development of a small intestinal fistula secondary to abscess formation adjacent to loops of small intestine is known to occur,[10] though we had not encountered this complication previously. Vigorous metabolic support and adequate drainage of the abscess, relieving the partial distal intestinal obstruction, allowed the fistula to close spontaneously.

Summary

A case of acute obstructive appendicitis caused by an ingested .22 calibre bullet is reported and the patho-physiology briefly discussed. Severe septic complications, including a small bowel fistula, occurred following appendectomy. The patient eventually made a complete recovery. •

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NATIONAL AFFAIRS

Colorado Delegate's Report of the Interim Session of The 23rd Clinical Convention of The American Medical Association, held in Denver, Colorado November 30 — December 3, 1969

In what doubtless will become a historically significant meeting, the AMA House of Delegates at its 23rd Clinical Convention adopted a series of recommendations to provide care for the nation's poor; set in motion a process to make long-range planning and development a permanent program of the Association; issued a clearcut statement on marijuana; and voted to discontinue the AMA-ERF's Institute for Biomedical Research as soon as its Board of Directors deems feasible.

Those actions, among many others, resulted from the House's consideration of 99 items of business: 22 reports from the Board of Trustees; 3 special reports; 1 from the Council on Constitution and Bylaws; 5 from the Council on Medical Education; 2 from the Council on Medical Service; and 66 resolutions (5 of which were memorials).

During its nine hours and 33 minutes of formal sessions, the House also:

. . . Heard an address by President Gerald D. Dorman, M.D.

. . . Voted the AMA Distinguished Service Award for 1970 to Henry L. Bockus, M.D., professor of medicine emeritus at the University of Pennsylvania School of Medicine.

. . . Chose John S. Millis, PhD, president of Western Reserve University, Cleveland, Ohio, to receive the 1970 Citation of a Layman for Distinguished Service.

. . . Paid tribute to John H. Talbott, M.D., who has been editor of the Journal of the American Medical Association since 1959 and who becomes editor emeritus on January 1, 1970.

. . . Elected Carroll Witten, M.D., Louisville, Ky., to the Council on Constitution and Bylaws to fill the vacancy created by the death of James M. Kolb., Sr., M.D.

. . . Saw Ward Darley, M.D., Denver, receive the first Distinguished Service Award of the American Board of Family Practice.

. . . Heard reports by the presidents of the American Hospital Association, AMPAC and the Woman's Auxiliary.

. . . And gave a standing ovation to the remarks of Captain James Lovell, command pilot for Apollo 13 and chairman of the President's Commission on Physical Fitness and Sports.

President's Address

At the opening session of the House, President Dorman challenged the AMA to establish or see to the establishment of a workable system of patient care for all the people of the nation; and to strengthen the Association itself by making it relevant to all physicians.

Regarding the first of those, the president said "the AMA can serve the best interests of physicians only when we serve those of the patient first. We are banded together to make ourselves more effective physicians so that we can serve our patients better."

He emphasized that "In the decade ahead" (a decade he titled "The Significant Seventies") the AMA must become—and prove to the public through visible action that it has become—more patient oriented."

In so doing, he said, medicine must take on the challenges of problems such as the alcoholic, the drug user, the fat man, the smoker and the drunken driver.

Dr. Dorman added that meeting all of the problems calls for a "separate, cabinet-rank department of health, drawing together all health activities of the government under one roof."

Regarding the AMA itself, the president said the Association has concentrated on being an organization for the physician in private practice. Now, he added, it must strive to attract physicians who are educators, researchers, administrators and in federal service.

Another segment of the medical profession that must be attracted is the future physician, Dr. Dorman said. The AMA must find ways "to attract medical students, interns, residents and other young physicians." Anticipating objections, he said, "We need to face up realistically to the fact that although we don't like the criticism of some of the younger members and would-be members of our profession—and perhaps we don't approve of the leftward lean of some of their politics—these young professionals are nonetheless as much, or more, patient-oriented than some of us."

To accomplish the AMA's goals, Dr. Dorman warned, "We may have to alter certain of our cherished traditions. We must be prepared to accept and support totally new ideas, whether we devise them or they are devised by somebody else, providing they work well after adequate trial."

Health Care of The Poor

The House adopted these statements of policy, many parts of which are reaffirmation of existing policy:

"It is a basic right of every citizen to have available to him adequate health care; it is a basic right of every citizen to have a free choice of physician and institution . . .; the medical profession, using all means at its disposal, should endeavor to make good medical care available to each person.

"The medical profession must take the leadership and actively support constructive community efforts to eliminate those conditions that adversely affect health.

"The health problems of the poor are basically community health problems, and . . . programs must be adapted to local needs.

"Health care for the poor should not be disassociated from but rather should be a vital part of, the overall health care system."

The adopted report contained these recommendations:

Increased funding of effective government programs for the health care of the poor and medically indigent; multiple-year funding in selected programs such as neighborhood health centers; governmental and private programs to eliminate unfavorable environmental conditions, particularly in disadvantaged areas; AMA support of and participation in a number of experimental projects to develop and evaluate innovative methods of health care delivery with a variety of provider reimbursement mechanisms.

Increase of physician services in urban slum areas by joint AMA-governmental action for a volunteer physician recruitment program for service in areas of need (a Project USA counterpart of the Volunteer Physicians for Vietnam); by support of medical school scholarships provided by state and county medical societies for students from disadvantaged families, in the hope they will return to practice in areas of need; and by permitting part-time practice elsewhere by "full-time" physicians employed by government funded programs for the poor, provided such practice does not interfere with effective service to the poor community.

Expansion of health careers by increasing recruitment from disadvantaged areas; increased attention by medical schools to all aspects of community medicine; development of educational materials for disadvantaged people in language that reflects their cultural backgrounds and living conditions; emphasis on prenatal and postnatal care and preventive care for infants; wider dissemination of family-planning counseling and supplies for those who want them; cooperation with medical and allied health organizations and student medical associations to improve delivery of health services to the poor.

Improved transportation for poor patients; adequate foods and diets of good nutritional quality for low-income families; enforcement of existing federal and local authority to halt quackery, especially that which exploits the poor; programs to raise the level of mental health services for the poor; and increased participation of minority group physicians in AMA activities.

Planning and Development

The House accepted a report of the Board of Trustees which announced its formation of a Committee on Program Priorities to work closely with its Finance Committee to evaluate present and future utilization of the resources of the AMA.

After considerable reference committee and House floor debate on the report of the Committee on Planning and Development (both the majority and minority reports), the House voted:

(1) To establish an ad hoc Committee on Long Range Planning and Development. Its membership is nine, appointed as follows: one from the Board of Trustees; five from the House; one from SAMA; and two from the AMA membership at large.

The ad hoc committee will receive the majority and minority reports, all reviews and correspondence on the subject and the transcript of the proceedings of the reference committee that considered both reports. It will study and make recommendations concerning the structuring of and the charge to a permanent Committee on Long Range Planning and Development and report those recommendations to the House at the 1970 Annual Convention.

(2) To send the majority and minority reports "to the component state societies for such specific action by their governing bodies as they deem warranted, it being understood that the resolutions so generated and all recommendations made in the reports (majority and minority) will be considered by the appropriate reference committees at the Annual Convention of 1970."

Statement of Marijuana

The House adopted a policy statement on marijuana which includes the following points:

"Cannabis (marijuana) is a dangerous drug and as such is a public health concern. It is a psychoactive substance which can have a marked deleterious effect on individual performance and social productivity. A significant number of exposed persons become chronic users with concomitant medical and interpersonal problems.

"The sale and possession of marijuana should not be legalized . . . . If all controls on marijuana were eliminated potent preparations would dominate the market, and if the potency were legally controlled, predictably there would be an illicit market for the more powerful forms—leading to more serious medical and social consequences.

"The handling of offenders should be individualized . . . . Where penalties are required the courts should have sufficient discretion to deal flexibly with violators . . . .

"'Additional research on marijuana should be encouraged . . . .

"The AMA should continue its educational programs to all segments of the population with respect to the use of marijuana . . . Physicians, frequently and forcefully, should call attention to the problems of all forms of drug abuse and drug dependence, including those which arise from the use of marijuana."

AMA-ERF Institute for Biomedical Research

On the reluctant recommendation of the AMA-ERF Liaison Committee of the House of Delegates, and after hearing much praise of the work of the Institute for Biomedical Research, the House adopted the following:

"Whereas, your committee recognizes the vast sums of monies that would be involved in the transfer of the present site of the Institute for Biomedical Research to an area adjacent to the University of Chicago; and . . . acknowledges the multimillion dollar cost to AMA for maintenance and operation if such a move were made; and . . . the possibility of obtaining outside funds . . . is unpredictable; and . . . the current cost of maintaining the Institute at its present location is constantly rising, with no predictable sources of outside funds being available, and without an increase in dues; therefore be it resolved that the Institute for Biomedical Research be discontinued as soon as the Board of Directors of AMA-ERF deems feasible; and be it further resolved that the Liaison Committee to AMA-ERF commends and recommends that this House of Delegates commends Dr. George Beadle, current Director of the Institute and the following members: Mr. George R. Collins, Clyde R. Goodheart, M.D., Oscar M. Hechter, Ph.D., Rodolfo Llinas, M.D., Ph.D., Howard A. Schneider, Ph.D., Dan W. Urry, Ph.D., and all other personnel connected with the Institute. These people have contributed to medicine in their specific fields of research under the auspices of the AMA."

Private Practice of Medicine

In response to a special report and two resolutions, the House took the following action to support private practice:

"Whereas, the private practice of medicine is still believed to be the best method of serving mankind's medical needs; and . . . there is no specifically designated method in organized medicine for the promotion of private practice; therefore be it resolved that the House of Delegates establish a Committee on Private Practice, which shall consist of nine active members of the Association and be constituted as a standing committee of the Council on Medical Service, a council of this House of Delegates."

Functions of the committee are to encourage and promote the private practice of medicine; to develop new methods that will promote private practice throughout medical school, graduate and postgraduate training; help the private practitioner improve his method of providing medical care (including business practices and utilization of allies); publicize the merits of private practice; encourage and help the development of similar committees by state medical associations; and maintain constant liaison with other committees and councils of the AMA to achieve those objectives.

Medicine and Government

The House adopted a report explaining the Comprehensive Health Planning and Regional Medical Programs and their interrelations, and affirmed its support of the concept of Regional Medical Programs as enacted in PL 89-239 and urged members to help guide Regional Medical Programs in line with the highest tradition of the private practice of medicine.

Expressed its "firm opposition to on-site auditing in physicians' offices of tax-supported programs by representatives of governmental agencies" and urged that problems between physicians and intermediaries or between physicians and governmental agencies be referred to local peer review committees.

Reaffirmed the AMA's official position that it will help federal agencies in "their quest for physicians who are errant in their participation in providing medical services to medicare and medicaid patients."

Opposed federal physician licensing and encouraged "state medical associations to work with their state legislatures to strengthen state laws, if necessary, to better control the few physicians who would tarnish the image of the whole profession."

Accepted a role of leadership in devising innovative programs for improving the operation of the medicaid program by utilizing existing mechanisms for the financing and delivery of health services within the private sector of the economy. In connection with pilot programs under Title XIX, the House resolved that "the Department of Health, Education, and Welfare spell out the basic insurance requirements, setting forth the minimum benefits specified by law, which the states might place to bid."

Urged that the AMA confer with federal agencies concerning feasibility of the government's annual publication of a compendium of federal laws applicable to health and medicine, with the rules and regulations of administrative bodies pertaining to them.

Resolved to continue activities aimed at insuring that "in all matters relating to the health of the public and the practice of medicine, liaison between the appropriate federal officers, departments and agencies is conducted directly with the American Medical Association."

Opposed legislation requiring the filing of information reports by insurance carriers or other third-party payers of payments made to patients, since the reports would not necessarily indicate what, if any, payment was made to physicians.

Opposed, "in conjunction with other professional organizations . . . the Senate Finance Committee amendment which militates against professional corporations."

Adopted a legislative proposal that would require (unless the physician designates otherwise) that the labels of drug containers dispensed to patients carry the established or trade name, quantity and strength of the drug dispensed. However, the House opposed the use of compulsory government prescription forms.

Adopted a report opposing establishment of a School of Health Sciences under the auspices of the Department of Defense, stating that "the granting of professional and academic degrees should remain within the purview of educational institutions and not become a prerogative of the federal government."

Cost of Care

Expressing deep concern about the ever-increasing costs of hospital care services, the House resolved that the "AMA Board of Trustees request the Board of Trustees of the American Hospital Association to join with it in urging hospital boards and hospital medical staffs to develop and institute cost control measures for hospital care services."

The House also resolved that it "reaffirms its endorsement of the tax credit plan and urges the Board of Trustees to give this plan the strongest support and the widest publicity among members of the Association and the public." In addition, it urged AMA councils and committees to intensify efforts "to develop other realistic and effective plans of medical care coverage available for all persons in the United States, utilizing multiple methods of financing and free choice of mechanism based on adequate standards of coverage."

At the same time, the House urged all state medical associations to "submit promptly any other realistic proposals which they believe should be developed as AMA proposals for effective, widely available medical care insurance or prepayment plans."

Also in connection with cost, the House recognized that "various news media and agencies of the federal government routinely blame the medical profession for the rising costs of health care; and . . . some physicians and even the publications of the American Medical Association . . . use the erroneous expression health care when they should use the correct term medical care." The House resolved that "the Board of Trustees . . . initiate, promptly, remedial measures to clarify the meaning of the expressions 'medical care' and 'health care' and to assure their correct usage in all official publications of the American Medical Association" and that the executive vice president design activities "to correct the terminology of the lay press and enlighten the understanding of the public."

Strengthening the AMA

In his address, President Dorman made the following recommendation which the House referred to the Council on Constitution and Bylaws for study and possible action:

"I would like to suggest . . . another category of membership . . . to include those members of the State Department, for instance, who are around the world taking care of our consular people; of our people in various countries and capitals of the world; who are not now eligible through membership in county societies to belong to the AMA. I would like to see a membership that is much like the membership of our armed forces, of our Veterans Administration or of our Public Health Service. These men look to us for advice and for leadership, and I would like to see us give them a home."

The House also urged state and county medical societies "to take action to make available to interns and residents active membership or its equivalent" and resolved that "the Council on Medical Education and other bodies within the American Medical Association intensify their efforts to initiate additional meetings and encourage continuing dialogue with medical students, preferably in conjunction with local chapters of SAMA; interns and residents in their respective states."

Recommending a continuing study of trends of membership in the AMA, the House resolved that the Board of Trustees "direct a task force to develop a realistic program to correct any cause which may result in a loss of potential physician members, and carry forward an active recruitment effort."

The House directed that the AMA "aggressively pursue close working relationship with the medical specialty societies" and adopted a Board report describing its recently created Commission on Foreign Medical Graduates, consisting of representatives from the AMA, American Hospital Association, Association of American Medical Colleges, Federation of State Medical Boards, Association for Hospital Medical Education, National Medical Association, Advisory Board for Medical Specialties and the Education Council for Foreign Medical Graduates.

A resolution was adopted strongly urging the Council on Medical Education and the specialty boards "to move forward with the acceptance of qualified osteopathic physicians into their training program and specialty board examinations." The House noted that the American Board of Internal Medicine is the sixth specialty board to declare that it will accept for examination graduates of osteopathic schools who have satisfactorily completed the requirements of the board in regard to approved internship, residency and fellowship training.

Additional Actions of The House

Approved essentials of an accredited educational program for orthopaedic assistants.

Approved essentials of an accredited educational program for radiologic technologists.

Adopted a report on socioeconomics in the education of the young physician.

Accepted for information a progress report on the establishment of a specialty board in allergy.

Adopted a resolution suggesting that educational opportunity for students, interns and residents not be limited to university hospitals, but "expose these trainees to the merits of practice under a variety of environmental circumstances."

Endorsed Standards VIII and IX of the Governing Body and Management Section of the Revised Standards for Hospital Accreditation.

Adopted guidelines for development of new health occupations.

Resolved that the AMA, state and local medical societies "intensify their support of the private and public agencies in the fulfilling of their responsibilities in promoting environmental health."

Approved a report on professional liability that said "the feasibility of an AMA-sponsored professional liability insurance program is now being considered by the Board of Trustees."

Reaffirmed present policy on therapeutic abortion while rejecting a resolution that urged revision of state laws to permit abortion upon demand.

Kenneth C. Sawyer, M.D.
Gatewood Milligan, M.D.
Robert C. McCurdy, M.D.

TEN RULES FOR AVOIDING LAWSUITS

To reduce the number of doctors who appear in court as defendants, a Cleveland specialist in the defense of medical liability cases has offered some guidelines for medical practices. The following recommendations were presented by attorney R. Crawford Morris in the February, 1969 issue of *The Physician's Legal Brief:*

(1) The physician can usually decline to accept a patient if he does so before he places himself in the position of abandoning the patient.

(2) Never guarantee a cure.

(3) Watch the time factor, especially if there has been an unfortunate result. This rule relates to the statute of limitations as they vary in each state.

(4) Keep up with the advances in medicine. A physician will be judged by what is considered good medical care at the time he renders the treatment.

(5) Do not use unnecessary experimental procedures. If an experimental procedure is deemed necessary, announce it as such, and obtain a written informed consent for the procedure.

(6) Make a simple, reasonable disclosure of the risks involved, unless there is a therapeutic reason for not telling the patient. In these instances, tell the patient's relatives, but obtain an informed consent from the patient for everything done.

(7) Keep good records.

(8) Cooperate with the medical profession.

(9) Do not be hesitant about consultation.

(10) Maintain good public relations.

THE WASHINGTON SCENE

A monthly news summary from the nation's Capital by the Washington Office of the AMA.

The Senate Finance Committee approved a staff report on medicare and medicaid which was critical of both physicians and administration of the health care programs. It included a recommendation for fee schedules for physicians' services.

In a joint statement, the presidents of the American Medical Association and the National Medical Association pledged support of their organizations to the committee's efforts to correct deficiencies and abuses in the two programs. However, the two spokesmen for organized medicine said "it would be tragic if . . . regulations were adopted whose effect would be to deny a greatly improved level of health care to the ghettos."

The AMA-NMA statement said that "we were greatly encouraged by the committee's comment that it 'believes that the majority of physicians for whom information was requested with respect to medicare and medicaid as presently structured have dealt fairly with these federal programs and with the federal government.' "

In regard to abuses and fraud, the statement said:

"Where these abuses exist, they must be rooted out. Both the AMA and the NMA are prepared to take very vigorous action within their power to help the committee and the government accomplish this."

It was noted that the committee had denied an AMA request many months ago that it be given the names of physicians involved in the committee's investigation.

"Despite this," the statement said, "the AMA and the NMA through their own resources have been able to identify a number of physicians grossing more than $25,000 in these programs . . . .

"In some instances, medical societies had already taken appropriate action against individual physicians where the evidence warranted. In other instances, however, the AMA and the NMA have found that many of the physicians presumably included in the committee's study are dedicated physicians working in isolation in slum and rural areas who are literally being overwhelmed by a tide of sick humanity . . . .

"We therefore believe it would be unfortunate if the committee's report leads the public to believe that medicare and medicaid are riddled with fraud or that the number of physicians abusing the programs is large. Such is not the case . . . ."

The report said that incomplete and partial listings indicated 4,300 individual practitioners plus an additional 900 physician groups each received at least $25,000 from medicare in 1968, including 68 who received $100,000 or more. The report also included a long list of physicians by state receiving $25,000 or more from medicaid in 1968. None was named; listings were by code numbers.

"Hundreds of the payments profiles indicate that the physicians involved might be abusing the program," the report said. "For example, we found many general practitioners each paid $15,000, $20,000, or more for laboratory services. We found large payments being made for what appear to be inordinate numbers of injections. In many cases we found what is apparently overvisiting and gang-visiting of patients in hospitals and nursing homes.

"The staff believes that the majority of physicians on whom information was gathered provided medically necessary services for which they were entitled to charge and be reimbursed. On the other hand, medicare's payments structure did little to discourage—in fact, it encouraged—high fees, and thus may well have contributed to the very substantial payment totals to those same physicians."

Recently, the Social Security Administration reported that about 2,500 cases had been investigated for fraud or abuse during the first three and one-half years of medicare. It was emphasized that this was only a minuscule fraction of total medicare transactions. Social Security Commissioner Robert M. Ball said:

"Medicare pays about 30 million doctors' bills and 12 million bills from institutional providers of services each year. It is clear from our investigations that the number of attempts at fraud or abuse is relatively very small."

About half of the cases investigated, he said, resulted from clerical errors, misunderstandings or honest mistakes by physicians and health services. To Jan. 20, 1970, the SSA had referred the cases of 13 individuals and organizations to the Justice Department with recommendations for criminal prosecution for fraud. Two physicians have been convicted in U. S. district courts and indictments have been returned against another five physicians and one non-physician. Another five cases had been referred with recommendations that civil proceedings be started for the return of illegally collected funds. Early this year, social security investigators also were preparing an additional 35 possible fraud cases for referral to the Justice Department.

The most common types of alleged violation reported include physician and providers billing for services not rendered, excessive charges, alteration of bills, duplicate billing, misrepresentation of types of services or dates of services, unreported discounts, or kickbacks, and employee embezzlement, medicare officials said.

The report's recommendations were aimed at providing "bases for remedying the serious, costly, and pervasive problems" of the two programs and make them "work more efficiently and economically." However, it was conceded that physicians constitute the cardinal factor.

"The key to making the present system workable and acceptable is the physician and his medical society," the committee staff said. "We are persuaded that at this point in time neither the government nor its agents have the capacity to effectively audit medical practice to assure that a given physician functions responsibly in dealing with the publicly financed programs.

"While there is growing awareness among many physicians of the need for the profession to effectively police and discipline itself, performance has been spotty and isolated so far. Prompt action is necessary by organized medicine (and other health professions) to do what is required with respect to monitoring care provided and charges made for the care . . . .

"However, procedures which involve peer review should not be undertaken without precise spelling out and assurances that such review will be comprehensive and effective—not paper and token."

Report recommendations:

—Fee schedules for physicians' services.

—Generic prescribing of drugs.

—"Curb overutilization by requiring prior professional approval of elective procedures and expensive courses of treatment.

—Require the patient to name a "primary physician" to end "costly 'doctor shopping'. "

—Require states to provide medicaid recipients with statements outlining payments made in their behalf.

—Modify present law "to make practicable reasonable cost-sharing payments by the medically indigent."

—Prohibit independent collection and discount agencies from collecting medicaid or medicare due bills that providers have sold to them.

—Improve federal administration, and establish cooperative arrangements with and between states.

—Establish a medicaid fraud and abuse unit in HEW, and require states to establish similar units.

—Combine the medicare and medicaid advisory councils.

The world longs for peace, and peace begins in the heart of the individual when he comes to the realization that he can contribute to the well-being of those around him. Don't be afraid to become involved—involved perhaps to the point of addiction. The personal satisfaction received from involvement in a worthwhile project cannot help but be projected to those around you. Happiness is a habit, an addiction that spreads like ripples from a pebble tossed into a pond.

Patricia Kinnaman—LISTEN, November 1969

MEDICAL SCHOOL NOTES

University of Colorado Medical Center

Resignation of John J. Conger, PhD, as University of Colorado vice president for medical affairs was announced Jan. 8. Dr. Conger asked to be relieved of his administrative duties "on or before July 1, 1970, in order to return to my interests in teaching, writing and research." He has directed the affairs of the CU Medical Center in Denver since 1963. Dr. Conger will become a fellow of the Center for Advanced Study in the Behavioral Sciences at Stanford, Calif., for the 1970-71 academic year. During the year he will work to complete a book dealing with adolescence and social science and will pursue other studies in psychology and child development. He will return to the CU faculty as professor of clinical psychology after the year at Stanford.

During Dr. Conger's administration the Medical Center has more than doubled in size physically and has undergone major transitions in its education, research and service functions. Enrollment of students and trainees has increased from 952 in 1963 to 1,568 at the beginning of the current academic year. Curriculum of the School of Medicine has undergone extensive revision in the direction of greater interdisciplinary emphasis, increased flexibility in election of courses and practical experiences in relating the biomedical sciences to patient care. The School of Nursing, formerly divided between the Medical Center and the main campus in Boulder, has been consolidated on the medical campus, has intensified its graduate-level programs, and also has undergone a basic curriculum revision. The new School of Dentistry was created and is expected to admit its first dental students in the fall of 1972.

The extensive physical expansion project completed its first phase with the opening in 1965 of the new Colorado General Hospital and the Clinical Research Wing. Portions of the old hospital were remodeled to provide larger quarters for the expanded enrollments of the Schools of Nursing and Medicine, and the final remodeling phase is converting old medical school space into modern research and teaching facilities for the school.

The Medical Center's program in research and training has more than trebled since 1963. In that year, research and training grants totaled $4 million. Estimated total for the current academic year is $12.6 million, almost exclusively in non-state funds.

The years 1963-69 also saw construction of the John F. Kennedy Child Development Center, one of five such facilities in the nation, the development of a master plan for the orderly development of the Medical Center in the future, the inauguration of the Colorado-Wyoming Regional Medical Program, and designation of the Medical Center to receive a five-year Health Sciences Advancement Award from the National Institutes of Health.

* * * * *

C. Wesley Eisele, MD, associate dean for postgraduate medical education in the University of Colorado School of Medicine, has been inducted as an honorary member of the Colorado Assn. of Directors of Medical Education. The association fosters continuing professional education for the physicians who are members of the staffs of Colorado hospitals.

Dr. Eisele has been associate dean of the medical school since 1957 and also serves the school as professor of medicine and preventive medicine. Under his direction, more than a score of intensive short refresher and specialty courses are presented each year to a total registration of nearly 6,000 practicing physicians.

* * * * *

A grant of $7,823 to the University of Colorado Medical Center for a project aimed at finding cures for hearing loss is announced by the Deafness Research Foundation, national organization with headquarters in New York City. The grant is part of more than $250,000 allocated by the foundation to otological investigators at 25 institutions. A gift from the Alfred P. Sloan Foundation helped make possible many of the grants. Now in its 12th year of operation, The Deafness Research Foundation has been responsible for directing more than $3 million into otological research and related objectives since its establishment.

The Temporal Bone Banks Program for Ear Research, sponsored by the foundation, the American Academy of Ophthalmology and Otolaryngology, and the Armed Forces Institute of Pathology, affords an invaluable means by which hearing disorders are attacked. Through this unique project, described by the nation's leading ear specialists as one of the most significant steps ever taken to advance otological research, bequeathed inner ear structures of persons with ear disorders are studied along with the donor's medical and hearing records.

The laboratories of the CU Division of Otolaryngology participate in the national temporal bone bank program. Inquiries about bequests of temporal bones from persons who are deaf, hard-of-hearing or suffer from other ear disorders may be directed to the division at 4200 E. Ninth Ave., Denver 80220, or to the foundation's headquarters at 366 Madison Ave., New York City 10017.

University of Utah Medical Center

Maxwell M. Wintrobe, MD, past Department Chairman of Internal Medicine at the University of Utah Medical Center, has been recently presented with the Mayo Soley Award for Clinical Research. Dr. Wintrobe, nationally recognized for his definitive research in hematology, received the award at the twenty-third annual meeting of the Western Society for Clinical Research which was held in Carmel, California the last week in January. The Mayo Soley Award, which was first given in 1968, is presented to an individual, selected by an award committee, who has maintained a high standard of excellence in his clinical research endeavors. Dr. Wintrobe, chosen for his outstanding research achievements in the field of hematology, is the third recipient of the Mayo Soley Award.

University of New Mexico School of Medicine

Scott W. Jordan is studying the immediate effects of radiation on living tissues at the University of New Mexico School of Medicine at Los Alamos Scientific Laboratory.

Dr. Jordan, associate professor of pathology at the UNM medical school, is the first man to use the Los Alamos Laboratory's electron prototype accelerator in an experiment involving live animals. The accelerator is capable of providing intense doses of x-rays.

* * * * *

Heart transplants, cholesterol production in the body, and control of blood volume in the human heart are three of the vital areas which will be studied at University of New Mexico School of Medicine because of three grants from the New Mexico Heart Association. Since February is Heart Month, these grants are especially timely in illustrating the work done in New Mexico by the Heart Association.

* * * * *

More than 70 medical books printed at the turn of the century—including one on the early New Mexico problem of consumption—have been donated to the University of New Mexico School of Medicine. The gift is from Mrs. William D. Radcliffe of Belen, wife of the late Dr. Radcliffe, and from Mrs. Irene Douglas, his daughter.

Included in the medical books are such titles as "Science and Art of Midwifery," published in 1881; "Lydia Pinkham's Private Textbook"; an 1875 edition of the "Pocket Anatomist"; and an 1899 volume of "Treatment of the Sick." The books have been placed in a special section of the medical school library, and are a welcome addition to building an informative, interesting library for the use of medical students and New Mexico physicians.

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OBITUARIES

Colorado

Harry Gauss, MD. Once in a decade or a generation, a great figure appears, characterized by academic excellence, professional achievement, and dedication to all that is good in medicine. Such a man, Dr. Harry Gauss, died in Denver on December 1, 1969. He was graduated from Rush Medical College in 1915, following an academic record at Evanston Academy and the University of Chicago. He received his Master's Degree in 1916 and served internship at Cook County General Hospital and residency at the University of Minnesota Hospital. He had additional training at the University of Vienna, later to distinguish himself in internal medicine and gastroenterology. He was certified by the Board of Internal Medicine and Gastroenterology. He served his country as a Major in the Medical Corps in France from 1917 to 1919.

Doctor Gauss established private practice in Denver in 1922 and became known to many students and patients as the "father of gastroenterology" in the Rocky Mountain area. Among his personal honors were the Certificate of Merit by the Mayor of St. Louis for aiding in the beautification of that city, and the Chicago Daily News Medal for an essay on patriotism. He was elected to Sigma Xi at the University of Chicago and was a contributor to Libro de Oro Universidad Nacional de Buenos Aires. He was appointed Medical Examiner for His Majesty's Government of Great Britain in World War II, and was Correspondent and Abstractor for Exerpta Medica, Amsterdam, Nederlands. Doctor Gauss was awarded the Congressional Selective Service Medal for administration of the Selective Service System, and the Alumni Medal at the University of Colorado School of Medicine.

He was placed upon the Honorary Committee of the 44th Annual Session of the American College of Physicians and in 1964 received the Award of Honor from the Iliff School of Theology after serving on its Board of Trustees for fifteen years. Doctor Gauss published a book on clinical dietetics in 1931, in addition to seventy-six scientific papers. His wife, Elvia, and his children were always a stimulus to him. A man of dedication, he transferred his enthusiasm in research and patient care to students and colleagues. As a scientist and teacher he influenced those about him to pursue fundamental diagnostic and therapeutic procedures.

Louis W. Soland, MD, of Boulder, Colorado, died January 1, 1970 at the age of 58.

Doctor Soland, a lifetime resident of Colorado, was born in Louisville, Colorado May 16, 1911 and was educated in the Colorado public schools. He was graduated from Denver University in 1933 and from the University of Colorado School of Medicine in 1937. He subsequently interned at St. Luke's Hospital in Denver before practicing in Dillon for a year.

Doctor Soland served in the U.S. Army as a major, during World War II, from 1941-45, and for 19 years, practiced at Fort Logan serving as mayor of that community for two terms.

Doctor Soland was a member of Phi Rho Sigma Medical Fraternity, the American Medical Association, Boulder County Medical Society, Weld County Medical Society, Colorado Medical Society and the American Academy of General Practice.

He was a member of the Colorado Heart Association and served as chief of staff of Brighton Hospital and of the Wardenburg Student Health Center of the University of Colorado.

Doctor Soland is survived by his wife, Mrs. Marjorie W. Soland, a son, Louis W. Soland, Jr., of Staten Island, New York, and a daughter, Miss Marilyn Soland of Denver; also a brother, Brookes Soland of Topeka, Kansas, and a sister, Mrs. Mona Rangel of Glendale, California.

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THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Anatomy for Surgeons, v. 1: By William H. Hollinshead. New York, 1968, Hoeber. 619 p. Price: $20.00

Arrows of Mercy: By Philip Smith. New York, 1969, Doubleday. 244 p. Price: Review.

Art of Loving: By Erich Fromm. New York, 1956, Harper & Row. 133 p. Price: $1.50.

Aspects of Internalization: By Roy Schafer. New York, 1968, International University Press. 254 p. Price: $6.50.

Atlas of Diagnostic Techniques and Treatment of Intraocular Foreign Bodies: By William H. Havener and Sallie L. Gloeckner. St. Louis, 1969, Mosby. 197 p. Price: $19.50.

Biology of Amphibian Tumors: Edited by Merle Mizell. New York, 1969, Springer-Verlag. 484 p. Price: $19.20.

Cancer of the Head and Neck: By William S. MacComb and Gilbert H. Fletcher. Baltimore, 1967, Williams & Wilkins, 598 p. Price: $28.50.

Cardiovascular Surgery; Current Practice: By Thomas H. Burford and Thomas B. Ferguson. St. Louis, 1969, Mosby. 273 p. Price: $18.00

Clinical Neurosurgery: By Congress of Neurological Surgeons. Baltimore, 1969, Williams & Wilkins. 513 p. Price: $17.00.

Current Psychiatric Therapies, v. 9: By Jules H. Masserman. New York, 1969, Grune & Stratton. 311 p. Price: $15.00.

Diseases of Metabolism: By Garfield G. Duncan. 6th ed. Philadelphia, 1969, Saunders. 2 vols. Price: $32.50.

Early Days in The Mayo Clinic: By William F. Braasch. Springfield, Ill., 1969, Thomas. 42 p. Price: Review.

Expanding Theory and Practice In Family Therapy: Edited by Nathan Ackerman and others. New York, 1967, Family Service Assoc. of America. 182 p. Price: $5.00.

The Flight from Woman: By Karl Stern. New York, 1965, Noonday Press. 310 p. Price: $1.95.

Handbook of Ocular Therapeutics and Pharmacology: By Philip P. Ellis and Donn L. Smith. 3rd ed. St. Louis, 1969, Mosby. 251 p. Price: $10.75.

The Heart: By Frank H. Netter. Summit, N.J., 1969, Ciba. 293 p. Price: $29.50.

Immunologic Resistance To Carcinoma Produced by Electrocoagulation: By Alfred A. Strauss. Springfield, Ill., 1969, Thomas. 221 p. Price: $12.50.

Juvenile Rheumatoid Arthritis, v. 6 (Major Problems In Clinical Pediatrics): By Earl J. Brewer. Philadelphia, 1970, Saunders. 231 p. Price: Not Set.

Kidney Disease Services Facilities and Programs In The United States: By U.S. Public Health Service. Washington, D.C., 1969. 229 p. Price: Gift.

Lymphography In Cancer, v. 23 (Recent Results In Cancer Research): By W. A. Fuchs and others. New York, 1969, Springer-Verlag. 294 p. Price: $16.80.

Manic Depressive Illness: By George Winokur and others. St. Louis, 1969, Mosby. 186 p. Price: $6.50.

Manual of Medical Therapeutics: Edited by Jay W. Smith. 19th ed. Boston, 1969, Little, Brown. 391 p. Price: Gift.

Manual of Oral Surgery Techniques: By Warren Schram. Philadelphia, 1962, Saunders. 172 p. Price: Gift.

Operative Neurosurgery: By E. Stephens Gurdjian and L. Murray Thomas. 3rd ed. Baltimore, 1970, Williams & Wilkins. 609 p. Price: $20.39.

Personnel Administration and Labor Relations in Health Care Facilities: By James O. Hepner and others. St. Louis, 1969, Mosby. 391 p. Price: $15.00.

Posterior Colpotomy; Surgical Technique and Clinical Experience: By John A. Morris. Springfield, Ill., 1969, Thomas. 57 p. Price: $5.75.

Spirit In Man, Art, and Literature, v. 15 (Collected Works of Jung): By C. G. Jung. New York, 1969, Pantheon Books. 168 p. Price:$4.50.

Stomach Surgery: By Jacob A. Glassman. Springfield, Ill., 1970, Thomas. 379 p. Price: $18.50.

Structural Units of Medical and Biological Terms: By J. E. Schmidt. Springfield, Ill., 1969, Thomas. 172 p. Price: Review.

Surgery for the Stomach and Duodenum: Edited by Henry N. Harkins and Lloyd M. Nyhus. 2nd ed. Boston, 1969, Little, Brown. 934 p. Price: $38.50.

The Virology and Immunology of Cancer: By Lev A. Zilber and G. I. Abelev. New York, 1968, Pergamon Press. 474 p. Price: $21.00.

Way of Life: By William Osler. Springfield, Ill., 1969, Thomas. 41 p. Price: $3.95.

Book Reviews

Guides to the Evaluation of Permanent Impairment.

The availability of the twelfth guide in the series, "Guides to the Evaluation of Permanent Impairment" developed by the Committee on Rating of Mental and Physical Impairment. It is entitled: "Guides to the Evaluation of Permanent Impairment—The Skin"

This guide, like all the others in the series, has been designed primarily for use by physicians. The guide is, however, of interest and use to all concerned with the medical, administrative, or judicial aspects of programs for the disabled. The previously published guides in the series deal with the extremities and back; the visual system; the cardiovascular system; ear, nose, throat, and related structures; the central nervous system; the digestive system; the peripheral spinal nerves; the respiratory system; the endocrine system; mental illness; and the reproductive and urinary systems.

The Committee would appreciate your assistance in informing your subscribers of the recent publication of this guide in the Journal of the American Medical Association. A limited number of copies of this guide may be obtained, without charge, upon written request to the Committee on Rating of Mental and Physical Impairment, 535 North Dearborn Street, Chicago, Illinois 60610.

Raymond M. McKeown, MD
Chairman
Committee on Rating of
Mental and Physical Impairment

The Proceedings of the Artificial Heart Program Conference has been published by the National Heart and Lung Institute and copies are available for purchase from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. The price is $10.00 per copy.

This 1,129-page, hard-cover publication contains the entire proceedings of the Artificial Heart Program Conference held June 9-13, 1969 in Washington, D.C. by the Artificial Heart Program, National Heart and Lung Institute, National Institutes of Health.

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Nevada State Medical Association

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Associate Editor for New Mexico: Ralph R. Marshall, Albuquerque.

Executive Secretary: Mr. Ralph R. Marshall, 3010 Monte Vista Blvd., NE, Albuquerque; Telephone 265-8494, area code 505.

Utah State Medical Association

OFFICERS—1969-70—Terms of officers and committeemen expire at the Annual Session in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Session.

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Associate Editor, Rocky Mountain Medical Journal: Mr. Hoyt W. Brewster, Salt Lake City.

Executive Secretary: Mr. Hoyt W. Brewster, 42 South Fifth East St., Salt Lake City. Telephone EL. 5-7477.

Wyoming State Medical Society

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Delegate to AMA: Harlan B. Anderson, Casper.

Alternate Delegate to AMA: Thomas A. Nicholas, Buffalo.

Speaker of the House: Goode R. Cheatham, Jr., Casper.

Vice Speaker of the House: Norman R. Black, Cheyenne.

Scientific Editor for Wyoming, Rocky Mountain Medical Journal: Francis A. Barrett, Cheyenne.

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Executive Secretary: Mr. Robert Smith, P. O. Box 1221, Cheyenne, Wyoming 82001.

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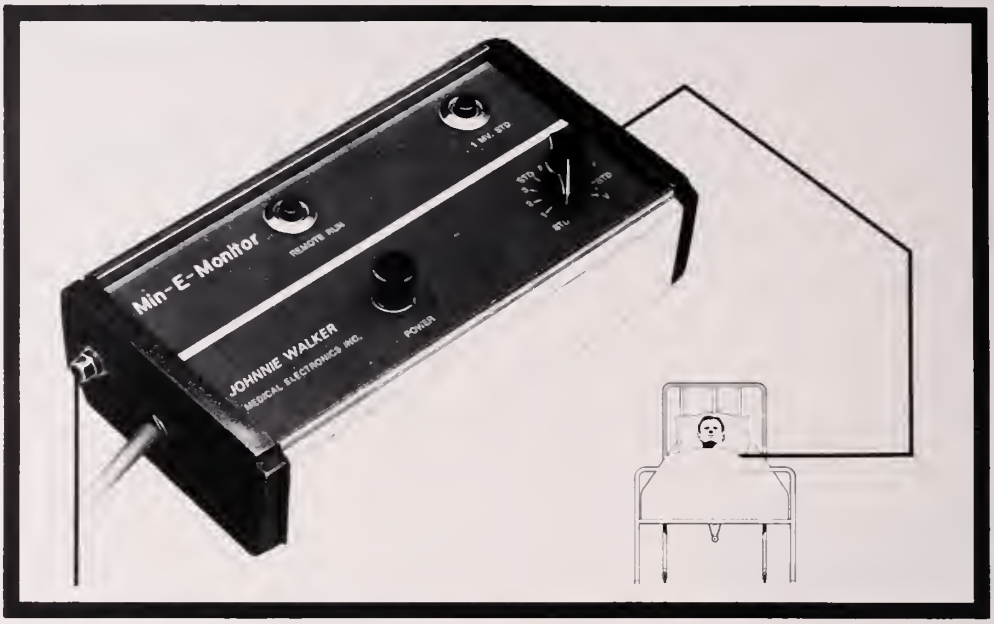

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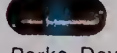

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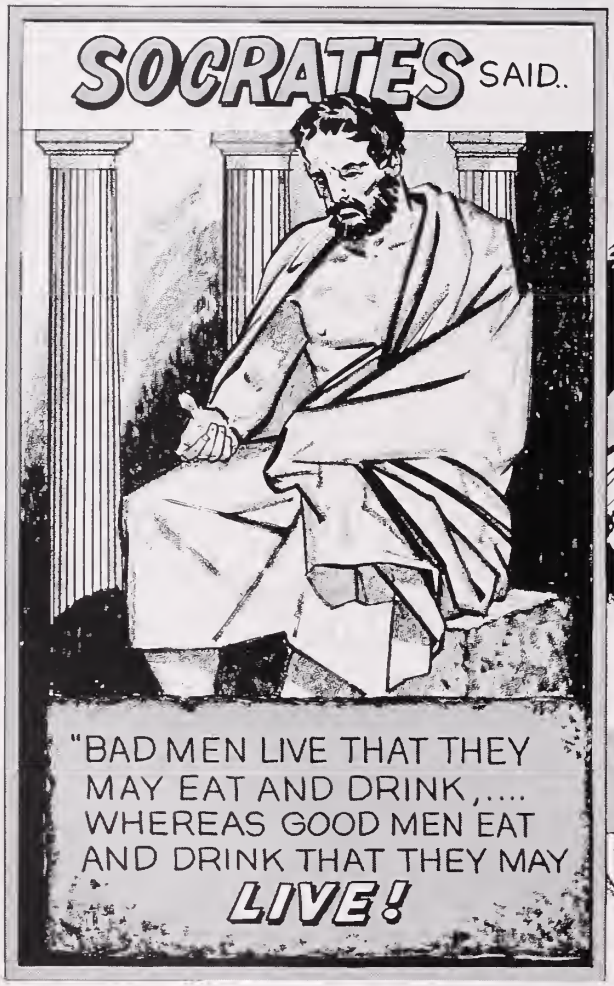

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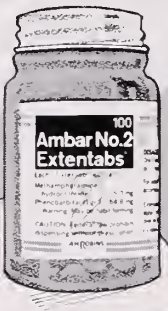

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References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms have occurred following abrupt discontinuance. Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence. In pregnancy, lactation or women of childbearing age, weigh potential benefit against possible hazard.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation, have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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useful in psychoneurotic states manifested by psychic tension with associated depressive symptoms

To the Editor:

I have read in the October 27, 1969, International issue of "Newsweek" that the Committee for National Health Insurance hopes to present a national health insurance bill to Congress next year. Our home is in Boulder, Colorado, but we are temporarily living in New Zealand and, therefore, have become very familiar with government-controlled medicine and other socialized programs.

I am certain most Americans would rather continue to pay directly for their own medical needs and treatment rather than be taxed through their payroll. As in most government programs, a great deal of this money would go towards exorbitant administrative costs while the field of medicine in the U. S. would rapidly deteriorate due to lack of incentive for further research and technology.

A plan such as the CNHI would be the first major step in the U. S. towards complete governmental control over our personal lives. Therefore, everything possible must be done to keep socialized medical programs from entering our country in order for the U. S. to retain the extremely high standard of medicine which we now enjoy and in order for the U. S. to remain the great nation it is.

The main purpose of this letter is to inquire from the Colorado Medical Society what steps I may take as an individual to see that plans such as CNHI are not adopted. Although we shall continue to live in New Zealand for at least one more year, I would be glad to write any letters or take any other action possible from here.

I look forward to your reply and any suggestions which you may have.

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Precautions: As with other thyroid preparations, an overdosage may cause diarrhea or cramps, nervousness, tremors, tachycardia, vomiting and continued weight loss. These effects may begin after four or five days or may not become apparent for one to three weeks. Patients receiving the drug should be observed closely for signs of thyrotoxicosis. If indications of overdosage appear, discontinue medication for 2-6 days, then resume at a lower dosage level. In patients with diabetes mellitus, careful observations should be made for changes in insulin or other antidiabetic drug dosage requirements. If hypothyroidism is accompanied by adrenal insufficiency, as Addison's Disease (chronic subcortical insufficiency), Simmonds's Disease (panhypopituitarism) or Cushing's syndrome (hyperadrenalism), these dysfunctions must be corrected prior to and during SYNTHROID (sodium levothyroxine) administration. The drug should be administered with caution to patients with cardiovascular disease; development of chest pains or other aggravations of cardiovascular disease requires a reduction in dosage.

Contraindications: Thyrotoxicosis, acute myocardial infarction.

Side effects: The effects of SYNTHROID (sodium levothyroxine) therapy are slow in being manifested. Side effects, when they do occur, are secondary to increased rates of body metabolism: sweating, heart palpitations with or without pain, leg cramps, and weight loss. Diarrhea, vomiting, and nervousness have also been observed. Myxedematous patients with heart disease have died from abrupt increases in dosage of thyroid drugs. Careful observation of the patient during the beginning of any thyroid therapy will alert the physician to any untoward effects.

In most cases with side effects, a reduction in dosage followed by a more gradual adjustment upward will result in a more accurate indication of the patient's dosage requirements without the appearance of side effects.

Dosage and Administration: The activity of a 0.1 mg. SYNTHROID (sodium levothyroxine) TABLET is equivalent to approximately one grain thyroid, U.S.P. Administer SYNTHROID tablets as a single daily dose, preferably after breakfast. In hypothyroidism without myxedema, the usual initial adult dose is 0.1 mg. daily, and may be increased by 0.1 mg. every 30 days until proper metabolic balance is attained. Clinical evaluation should be made monthly and PBI measurements about every 90 days. Final maintenance dosage will usually range from 0.2-0.4 mg. daily. In adult myxedema, starting dose should be 0.025 mg. daily. The dose may be increased to 0.05 mg. after two weeks and to 0.1 mg. at the end of a second two weeks. The daily dose may be further increased at two-month intervals by 0.1 mg. until the optimum maintenance dose is reached (0.1-1.0 mg. daily).

Supplied: Tablets: 0.025 mg., 0.05 mg., 0.1 mg., 0.15 mg., 0.2 mg., 0.3 mg., 0.5 mg., scored and color-coded, in bottles of 100 and 500. Injection: 500 mcg. lyophilized active ingredient and 10 mg. of Mannitol, N.F., in 10 ml. single-dose vial, with 5 ml. vial of Sodium Chloride Injection, U.S.P., as a diluent.

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Doctor Watson exposes a double agent

og on the Embankment. Two figures emerge into silhouette against a aloed street lamp. The flare of a match reveals the profile of Sherlock lolmes. As he lights his calabash, his companion speaks:

By Jove, Holmes, that amazing intuition of yours has proved right gain. What we're looking for is a single entity. I thought we were ealing with several others—even twins. But now—I'd say we've ncovered a double agent."

Tell me more, Watson, and be quick about it!"

Watson withdraws a folded paper from inside his greatcoat, and :ads aloud from it):

The key to the whole cypher is SYNTHROID (sodium levothy-)xine)" . . .

Shhh! Watson, not so loud! You'll alert our quarry."

Watson continues): "A single entity that serves two functions."

A master stroke, Watson."

Follow along, Holmes. In the neighborhood of 95% of the circulat-ıg thyroid hormone is levothyroxine—T_4 as you call it. T_4 is bound) thyroxine-binding proteins in the serum. It becomes available only radually to tissue cells—as free thyroxine."

"Is that why there's such a smooth, predictable response, Watson?"

"Quite! With agent T_4, SYNTHROID, the chances of a precipitous rise in metabolic rate are lessened."

"But how does 'free' thyroxine fit into the picture?"

"Well, Holmes, you might call it the tissue thyroid hormone—because 'free' thyroxine (that is, thyroxine not bound to protein) is active at the tissue level. It is gradually released from thyroxine-binding proteins. Each daily dose of SYNTHROID is mostly bound to thyroid-binding proteins, and slowly released as 'free' thyroxine—the form in which it is metabolically active."

"Magnificent, Watson! So protein-bound thyroxine is the major form of circulating thyroid hormone, and it is released as 'free' thyroxine. And that's why, SYNTHROID is able to simulate the normal process so artfully. Q.E.D."

"Not so fast, Holmes. SYNTHROID works for the *physician*, too. Because its dosage is more precisely controllable, and because response is so smooth and predictable, the *doctor* gets fewer phone calls in the wee hours from agitated patients. Both parties get more sleep!"

"Comforting, my dear doctor, to know that SYNTHROID, the 'single agent,' cleverly does the job of two."

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Precautions: Until patient's response has been determined, he should be cautioned against engaging in operations requiring alertness. Administer with care to patients with cardiac or peripheral vascular diseases or hypertension.
Side Effects: Hypersensitivity reactions including skin rashes, urticaria, hypotension and thrombocytopenia, have been reported on rare occasions. Drowsiness, lassitude, nausea, giddiness, dryness of the mouth, mydriasis, increased irritability or excitement may be encountered.
Dosage: 1 Extentab morning and evening.
Supplied: Bottles of 100 and 500.

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The pain of arthritis

relieved with MEASURIN® q. 8h. dosage

Double-strength Measurin timed-release aspirin offers a new kind of control for your arthritic patients. Each 10-grain tablet has over 6,000 microscopic reservoirs that release aspirin at a controlled rate—some right away and some later on. This means—fast relief, followed by long lasting relief. Throughout the day, Measurin gives your patients freedom from a 4-hour dosage schedule. Measurin can help your patients get a good night's sleep, uninterrupted by the need for an extra dose of aspirin. And, taken at bedtime, it also helps ease morning joint discomfort and stiffness.

For Professional Samples write:
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BREON LABORATORIES INC.
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MEASURIN®
TIMED-RELEASE ASPIRIN

ECONOMICAL • EFFECTIVE • LONG LASTING PAIN RELIEF
Dosage: 2 tablets followed by 1 or 2 tablets every 8 hours as required, not to exceed 6 tablets in 24 hours. For maximum nighttime pain relief and to help relieve early morning stiffness, 2 tablets at bedtime.
Available: Bottles of 12, 36 and 60 tablets.

One of seven dosage forms

Thorazine®

brand of chlorpromazine HCl

Spansule®

brand of sustained release capsules

Available in 30 mg., 75 mg., 150 mg., 200 mg. and 300 mg. strengths.

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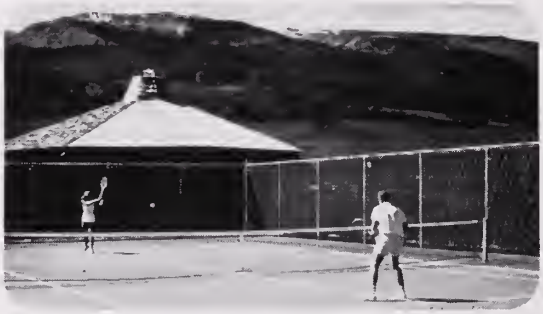
A better Doctor to your patients
A more interesting husband to your wife
A more understanding father to your kids
A more complete person to yourself

Colorado Medical Society presents
"Communication, the cause of it all"
. . . a three-day family learning experience
in the Colorado Rockies.
August 3, 4, 5.
Most of all, it's fun!



Tennis in the crisp, clean mountain air

An afternoon on the championship golf course

Relaxing beside one of Snowmass' many pools

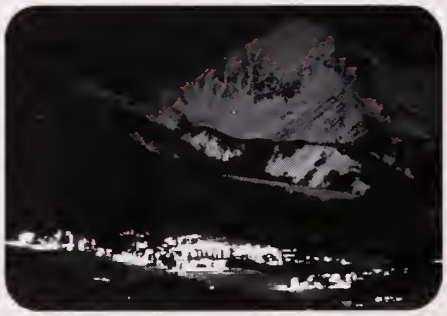
It will be one of the most exciting, stimulating, awakening experiences you've ever had. It's a family affair . . . and most of all, it's fun! You, your wife and your children are all involved. You can make it the start of a great family vacation in the Rocky Mountains at Snowmass-at-Aspen.

"Communications, the cause of it all" is a three-day family learning experience presented by Colorado Medical Society. It deals with the single most important function that relates one human being to another . . . communication. It is the key to doctor-patient understanding. It's the basis upon which good marriages are built. And, it is, without question, the most important element of parent-child relationship. All members of the Rocky Mountain Medical Conference are welcome.

This is not just a "seminar" because we feel the key to helping you become a better, more effective doctor starts with you as a person, you as a member of a family; then progresses to you as a member of your profession. Helping you become a more effective doctor goes deeper than "programming" you with vast amounts of technical information. It involves the human side of all your relationships . . . communications. It involves your wife, it involves your children, it involves you, and what you really know about your communication with others.

snowmass-at-aspen™

Wild daisies over Snowmass' West Village



Night at one of America's great resorts

Riding over meadows and mountain trails

"I know you believe you understand what you think I said, but I'm not sure you realize that what you heard is not what I meant."

It happens every day! Communications are garbled because people have pre-conceived ideas about what you are going to say . . . . . or you have assumptions about people, and it influences what you hear. Sometimes the results are sad. Sometimes they are funny. And sometimes frustrating. "Understanding how you affect communication with others" is the title of the first morning's session. It starts to unconfuse things.

"Forget what is said, just remember to hear what is meant."

"I know that's what Dr. Adams said, but I think what he meant was . . ." Ever heard that before? Or, how about this: Wife: "Do you like my new dress?" Husband: "Yes." Wife: "What do you mean by that?" Husband: "I mean I like it." Wife: "It didn't sound like you meant you liked it." Husband: "Now you made it sound like I don't like it." Wife: "Do you?" Husband: "Yes." Wife: "What do you mean by that?" Etc. Etc. Theme of the second morning, "Understanding how others affect communication." It starts to clear away some of the communication smoke screens.

What do you say after you say "Hi, Honey!" What do you say after you say, "How was school today?"

It's been said that "a family that prays together, stays together." The same thing might be said about a family that communicates. How does your family communicate? Do communications flow from father on down? Do they flow from father *and* mother on down? Or, is there a free exchange in both directions? The third morning session gives you the tools to examine and improve family communications. There are creative exercises, spirited friendly competition with other families and free wheeling discussions. It's great fun, and will probably be your favorite session.

"Communication, the transfer of meaning."

Snowmass' colorful and glamorous dinner spots will tempt you to stay on into the evening. But if you do, you'll miss perhaps the most exciting, stimulating and thoroughly enjoyable sessions of the three days, the optional evening discussion groups. Each evening those who wish to participate will be exposed to a special "event" such as the film "David and Lisa," an academy award winner and a classic study of beautiful communication between two emotionally disturbed children. Given the background of the day's session and the fascinating "mix" of people, these sessions are lively and dynamic.

"The first thing to remember is that children are not just 'kids,' they're little people."

Kids are miniature people. They have their own likes, dislikes, pleasures, pressures . . . and eventually they grow into full size people. That is why, during this three-day learning experience, children are treated as "people." Children from seven to eighteen will meet and work with smaller groups, based on their ages. Much of the same material used with parents will be employed. Teenagers are welcomed and encouraged to attend and participate in the optional evening discussions. The generation gap starts to close!

"People are the only creatures on earth who can talk themselves into trouble."

Communication is "The beginning of understanding." And with understanding comes personal and professional growth. This is a unique and unusual educational experience in that its prime objective is to help make you a more effective member of your profession through personal growth. We promise you, it will be the best thing to happen to your summer.

"Words don't have meaning, only people have meaning."

Come early, stay late. Snowmass-at-Aspen, with all its magnificent Rocky Mountain scenery, and vast recreational facilities, is the perfect spot for a family vacation. Extend your stay to a week or two and really get to know the land, the people, and the activities that make this one of the finest vacation communities in America. Special lodge and condominium rates are offered to those guests who wish to extend their stay to a week or more.

COST: Because this is a family-oriented, educational experience, the per person cost is far below that of regular seminars. Costs for the course itself are:

Physician	$175
Wife	30
Each child	15

"Communication, the cause of it all."

Each day is devoted to formal sessions in the morning, afternoon free time, and an optional evening discussion program.

There are separate sessions each of the first two mornings for you, for your wife, and for your children (over 6). The third morning, families come together.

Everybody rides the chairlift to the top of the mountain for a family breakfast at spectacular Sam's Knob Restaurant. Then family members participate in communication exercises as a family unit.

The course material covered during the ladies' session is exactly the same as that of the men's. By splitting into two groups, husbands and wives are given the opportunity to meet new people and gain new experiences independently, then share their new experiences and new friends during the afternoon free time periods. And in so doing, the fun and excitement of the communication process begins.

Share your afternoons on the golf course with new friends, enjoy a nature hike in the mountains with your family, or perhaps pack a couple of families into jeeps and head for a picnic and some of the magnificent scenery of the high country. It's all part of the total learning climate created at Snowmass-at-Aspen.

For more information, including complete particulars on the course, Snowmass activities, and economical lodge and condominium rates, fill out and return the coupon below. A complete packet of registration information will be on its way within 24 hours. Act now; all registrations must be in no later than July 1, 1970.

Tax deduction of expenses.

An income tax deduction is allowed for expenses of education (including travel, meals and lodging) undertaken to maintain and improve professional skills. The small extra costs incurred for family tuition, lodging and meals would not qualify.

Most of all, it's fun!

MAIL TO:
SNOWMASS
c/o **Colorado Medical Society**
1809 E. 18th Ave.
Denver, Colo. 80218

Please send the complete information packet on Snowmass, and Colorado Medical Society's Snowmass Communications Conference. August 3, 4, 5.

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CITY _____ STATE _____ ZIP _____

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IN EMPHYSEMA

optional therapy

THE mudranes®

All Mudranes are bronchodilator-mucolytic in action, and are indicated for symptomatic relief of bronchial asthma, emphysema, bronchiectasis and chronic bronchitis. **MUDRANE tablets** contain 195 mg. potassium iodide; 130 mg. aminophylline; 21 mg. phenobarbital (Warning: may be habit-forming); 16 mg. ephedrine HCl. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline-phenobarbital-ephedrine combinations. **Iodide side-effects:** May cause nausea. Very long use may cause goiter. Discontinue if symptoms of iodism develop. **Iodide contraindications:** Tuberculosis; pregnancy (to protect the fetus against possible depression of thyroid activity). **MUDRANE-2 tablets** contain 195 mg. potassium iodide; 130 mg. aminophylline. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline. **Iodide side-effects and contraindications are listed above. MUDRANE GG tablets** contain 100 mg. glyceryl guaiacolate; 130 mg. aminophylline; 21 mg. phenobarbital (Warning: may be habit-forming); 16 mg. ephedrine HCl. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline-phenobarbital-ephedrine combinations. **MUDRANE GG-2 tablets** contain 100 mg. glyceryl guaiacolate; 130 mg. aminophylline. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions:** Those for aminophylline. **MUDRANE GG Elixir.** Each teaspoonful (5 cc) contains 26 mg. glyceryl guaiacolate; 20 mg. theophylline; 5.4 mg. phenobarbital (Warning: may be habit-forming); 4 mg. ephedrine HCl. **Dosage:** Children, 1 cc for each 10 lbs. of body weight; one teaspoonful (5 cc) for a 50 lb. child. Dose may be repeated 3 or 4 times a day. Adult, one tablespoonful, 4 times daily. All doses should be followed with ½ to full glass of water. **Precautions:** See those listed above for Mudrane GG tablets.

MUDRANE—original formula
First choice

MUDRANE-2
When ephedrine is too exciting or is contraindicated

MUDRANE GG
During pregnancy or when K.I. is contraindicated or not tolerated

MUDRANE GG-2
A counterpart for Mudrane-2

MUDRANE GG ELIXIR
For pediatric use or where liquids are preferred

Clinical specimens available to physicians.

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Manufacturers of Ethical Pharmaceuticals

vacation in
a vial:
the spasm
reactors
in your practice
deserve

"the Donnatal® Effect"

	each tablet, capsule or 5 cc. of elixir (23% alcohol)	each Donnatal No. 2	each Extentab®
hyoscyamine sulfate	0.1037 mg.	0.1037 mg.	0.3111 mg.
atropine sulfate	0.0194 mg.	0.0194 mg.	0.0582 mg.
hyoscine hydrobromide	0.0065 mg.	0.0065 mg.	0.0195 mg.
phenobarbital	(¼ gr.) 16.2 mg.	(½ gr.) 32.4 mg.	(¾ gr.) 48.6 mg.
(Warning: may be habit forming)			

Brief Summary. Blurring of vision, dry mouth, difficult urination, and flushing or dryness of the skin may occur on higher dosage levels, rarely on usual dosage. Administer with caution to patients with incipient glaucoma or urinary bladder neck obstruction. Contraindicated in acute glaucoma, advanced renal or hepatic disease or a hypersensitivity to any of the ingredients.

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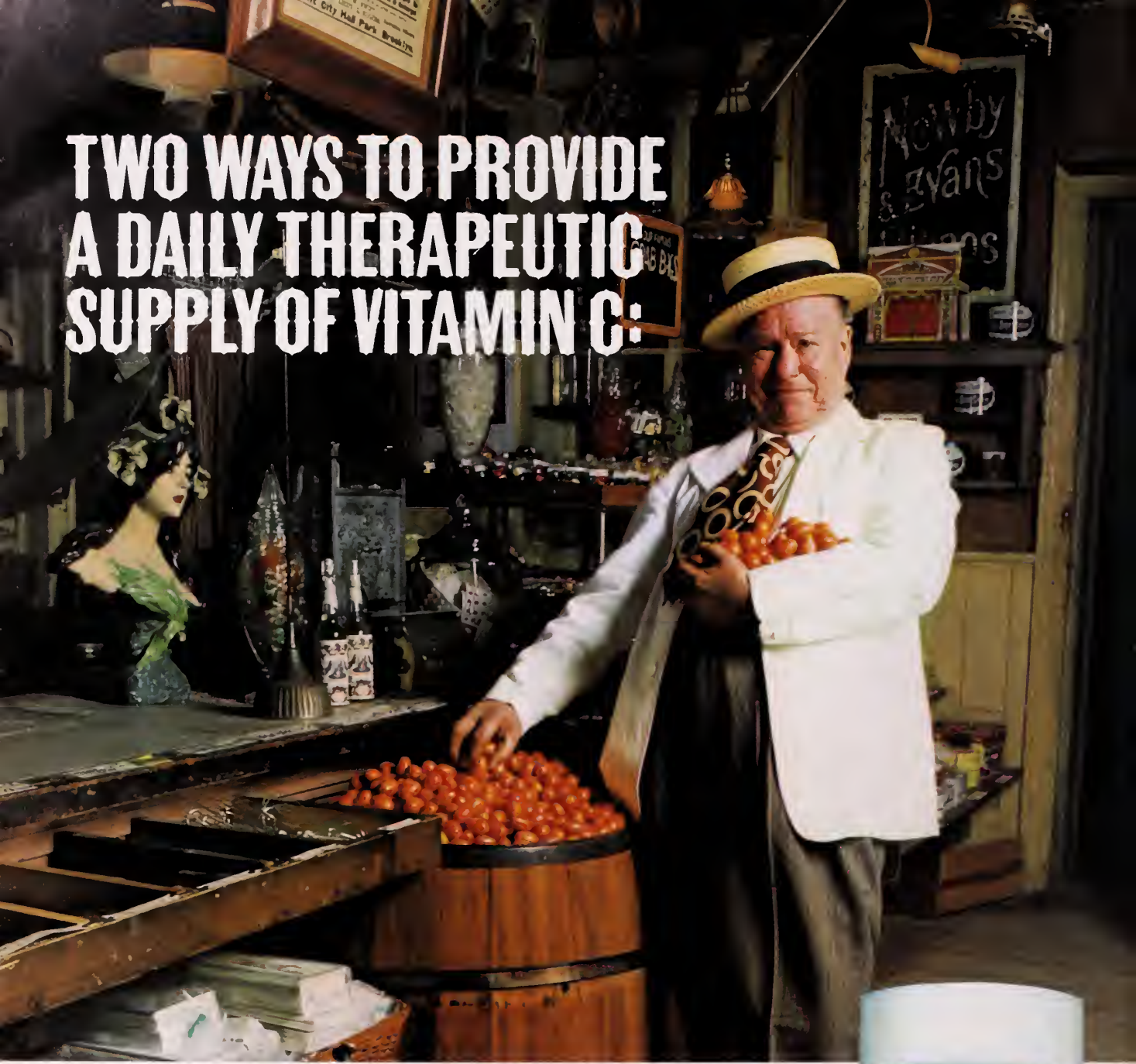

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50 KUMQUATS OR ONE ALLBEE® WITH C

Your patient would have to eat 1,500 kumquats a month, about 50 a day, to get as much Vitamin C as is contained in just one bottle of 30 Allbee with C capsules (taken one capsule daily). Allbee with C is a lot easier to come by too. Unlike kumquats, it's always in season. In addition, each capsule provides full therapeutic amounts of the B-complex vitamins. The handy bottle of 30 gives your patient a month's supply at a very reasonable price. Economy size of 100 also available. At pharmacies on your prescription or recommendation.

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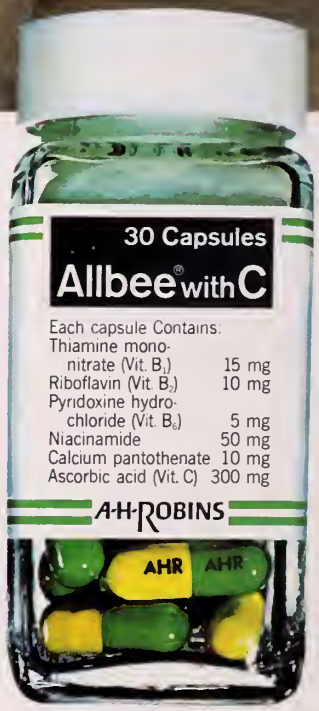

MEETINGS

4th Biennial Scientific Meeting
California Society of Anesthesiologists
Sahara Tahoe Hotel
Lake Tahoe, Nevada
June 12-14, 1970

Write: The American Society of Anesthesiologists, 515 Busse Highway, Park Ridge, Illinois 60068.

The Amercan College of
Emergency Physicians
2nd Scientific Assembly
Las Vegas, Nevada
October 18-23, 1970

Focus will be on the delivery of primary care in the hospital emergency department. For more details write: Executive Secretary, 120 West Saginaw, East Lansing, Michigan 48823.

17th Annual Meeting
American College of Sports Medicine
Sheraton-Western Skies Motor Hotel
Albuquerque, New Mexico
May 7-9, 1970

For more information write American College of Sports Medicine, 1440 Monroe St., Madison, Wisconsin 53706.

The Montana Academy of General Practice
Scientific Session
West Yellowstone, Montana
June 18-20, 1970

Combine an excellent medical meeting with family vacation and tour of beautiful Yellowstone National Park. For more information write J. A. Ross, MD, Program Chairman, 3511 1st Avenue N., Great Falls, Montana 59401.

Intensive Coronary Care
Symposia for Physicians
St. Patrick Hospital and the
University of Montana
Missoula, Montana
June 14-18, 1970
September 13-17, 1970
March 21-25, 1971

Registration is limited to 22 physicians for each symposium. First choice will be given to physicians who are staff members of hospitals participating in the Coronary Care Training Program, an activity of the Mountain States RMP. Physicians from other hospitals will be welcome, as space permits. Address correspondence to: Harold A. Braun, M.D., Medical Director, WICHE Mountain States RMP, Coronary Care Training Program, 500 W. Broadway, Missoula, Montana 59801.

University of Colorado School of Medicine
13th Annual Postgraduate Medical
Education Course in Pediatrics
July 19-22, 1970

Contact Postgraduate Medical Education at University of Colorado School of Medicine, 4200 E. 9th Ave., Denver, Colo. 80220.

Quantitative Methods Workshop
Vail, Colorado
July 13-16, 1970
Administrative Workshop
National Association of Hearing
and Speech Agencies
Vail, Colorado
July 29-August 1, 1970

These meetings are part of the Continuing Education Program for the Department of Preventive Medicine, Division of Health Administration, University of Colorado Medical Center, Denver, Colorado. For more information contact Arvid B. Brekke, Director of Continuing Education, Division of Health Administration, University of Colorado Medical Center, 4200 E. 9th Avenue, Denver, Colo. 80220.

Annual Meeting of
The American Medical Society on Alcoholism
Chicago, Illinois
June 23-24, 1970

This meeting is in conjunction with the annual convention of the American Medical Association. The American Medical Society on Alcoholism is an association of 600 physicians with special interest and experience in the field of alcoholism. The purpose of the Society is to encourage fundamental research; to foster professional training in alcoholism treatment; and to disseminate the knowledge thus gained to both the scientific world and the general public. Although membership in the Society is limited to medical doctors, any professional people whose chief interest and work is in the field of alcoholism may attend.

Applications for registration may be obtained by writing to Dr. Ruth Fox, President, American Medical Society on Alcoholism, Inc., 150 East 52nd St., N.Y., N.Y. 10022.

11th Congress of the Pan-Pacific
Surgical Association
Hilton Hawaiian Village Hotel
Honolulu, Hawaii
February 26-March 3, 1972

Concurrent meetings will be held in Anesthesiology, Colon and Anorectal Surgery, General Surgery, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Thoracic-Cardiovascular, and Urology.

For details write: Pan-Pacific Surgical Association, 236 Alexander Young Building, Honolulu, Hawaii 96813.

—Program—

Eighty-Fourth Annual Meeting

NEW MEXICO MEDICAL SOCIETY

La Fonda Hotel

Santa Fe, New Mexico

May 14-16, 1970

Who may attend: All Doctors of Medicine and Osteopathic Physicians who are members of their respective state societies. There will be a registration fee to those who are not members of the New Mexico Medical Society. Medical students, interns, residents, physicians in Government service, nurses and student nurses may register without fee.

THURSDAY, MAY 14

9:00 a.m. ORIENTATION COURSE FOR NEW MEMBERS

12:15 p.m. LUNCHEON FOR NEW MEMBERS

2:00 p.m. FIRST SESSION, HOUSE OF DELEGATES

3:30 p.m. REFERENCE COMMITTEE HEARINGS

6:30 p.m. COCKTAIL PARTY honoring New Members and Delegates
Courtesy New Mexico Medical Society and Santa Fe County Medical Society

7:30 p.m. BANQUET of New Mexico Medical Political Action Committee
Congressman Durward Hall, M.D.
(R) Missouri

FRIDAY, MAY 15

9:00 a.m. OPENING CEREMONIES
Presiding: *Earl Flanagan, M.D.*, Immediate Past-President

WELCOME: *A. H. Bodelson, M.D.*, President, Santa Fe County Medical Society

PRESIDENTIAL ADDRESS:
Hugh B. Woodward, M.D., President, New Mexico Medical Society

FIRST CLINICAL SESSION

Presiding: *Hugh B. Woodward, M.D.*, Albuquerque

LOS ALAMOS MESON PHYSICS FACILITY AND ITS POTENTIAL APPLICATIONS TO BIOLOGY AND MEDICINE

9:30 a.m. THE LOS ALAMOS MESON PHYSICS FACILITY AND THE PHYSICAL PROPERTIES OF NEGATIVE PIONS

Louis Rosen, Ph.D., Los Alamos Scientific Laboratory, Division leader of medium-energy physics division which is concerned with design and construction of the Los Alamos Meson Physics Facility and eventual utilization

10:00 a.m. THE BIOLOGICAL PROPERTIES OF NEGATIVE PIONS

Wright H. Langham, Ph.D., Los Alamos Scientific Laboratory Group Leader of Biomedical Research

11:00 a.m. THE POTENTIAL USE OF NEGATIVE PIONS FOR CANCER THERAPY

Jan D. Shoop, M.D., Chief of Division Nuclear Medicine and Assistant Professor of Radiology, University of New Mexico School of Medicine

11:30 a.m. DISCUSSION OF PAPERS
Moderator: *Wright H. Langham, Ph.D.*, Group Leader

SECOND CLINICAL SESSION

Presiding: *Harry D. Ellis, M.D.*, President-Elect

ADOLESCENT BEHAVIOR, STUDENT REBELLION AND DRUG ABUSE

2:00 p.m. *Robert P. Masland, Jr., M.D.*, Assistant Clinical Professor of Pediatrics, Harvard University School of Medicine; Chief, The Adolescent's Unit, The Children's Hospital Medical Center, Boston, Massachusetts

3:30 p.m. *Graham Blaine, M.D.*, Instructor in Psychiatry, Harvard Medical School; Chief of Psychiatry, Harvard University Health Service, Boston, Massachusetts

Evening: SPECIALTY SOCIETY MEETINGS

THIRD CLINICAL SESSION

Presiding: *Vaun T. Floyd, M.D.*, Vice President

ULCERATIVE COLITIS

9:00 a.m. *Edward S. Judd, M.D.*, Staff Surgeon, Mayo Clinic and Professor of Surgery in the Mayo Graduate School of Medicine, Rochester, Minnesota

9:45 a.m. *Richard Sedlack, M.D.*, Consultant in Internal Medicine (Gastroenterology), Mayo Clinic and Instructor in Internal Medicine in the Mayo Graduate School of Medicine, Rochester, Minnesota

REGIONAL ENTERITIS

10:45 a.m. *Edward S. Judd, M.D.*

11:30 a.m. *Richard Sedlack, M.D.*

12:15 p.m. END OF CLINICAL PROGRAM

2:00 p.m. SECOND SESSION, HOUSE OF DELEGATES

6:30 p.m. COCKTAILS

7:30 p.m. BUFFET

8:30 p.m. THEATER PRESENTATION

Program for the Ladies

THURSDAY, MAY 14

6:30 p.m. Reception for New Members of the New Mexico Medical Society and Delegates. Courtesy: Santa Fe County Medical Society and New Mexico Medical Society

7:30 p.m. N.E.M.P.A.C. BANQUET
Speaker: Congressman, *Durward Hall, M. D.*, (R) Missouri

FRIDAY, MAY 15

12:00 p.m. FASHION SHOW LUNCHEON, La Fonda
Walking Tours
Shopping Guides

SATURDAY, MAY 16

6:30 p.m. COCKTAILS

7:30 p.m. BUFFET

8:30 p.m. THEATER PRESENTATION

Each 5 cc. contain erythromycin estolate equivalent to 250 mg. erythromycin base.
PINT (473 cc) M-148
Lilly
ILOSONE®
LIQUID
ERYTHROMYCIN ESTOLATE
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SHAKE WELL BEFORE USING
REFRIGERATE
AVOID FREEZING
PINT (473 cc) M-153
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LIQUID
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SHAKE WELL BEFORE USING
REFRIGERATE
AVOID FREEZING
When mixed as directed, each 5 cc. will contain erythromycin estolate equivalent to 125 mg. erythromycin base.
When mixed as directed, each cc. will contain erythromycin estolate equivalent to 100 mg. erythromycin base.
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CAPSULES, N.F.
125 mg.
Each Pulvule® contains erythromycin estolate equivalent to 125 mg. erythromycin base.
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Indianapolis, Indiana 46206
900761

WE HAVE great admiration for many television newscasters and commentators, marvel at their intelligence, their wit and charm, their fluent and spontaneous presentation in enviable grammar and diction. Especially, we admire their knowledge and expertise in many fields. They are gifted people. Several weeks ago they proved that they are also human!

They, Too, Are Human

These super beings react to criticism no differently than the rest of us. Their response to censure of the Vice President was reminiscent of the physicians' response a few years back to charges that medicine was not meeting many of the health needs of the nation—immediate, loud, emotional, unanimous—and also inadequate.

The two circumstances have many similarities. Like doctors, these journalists are dedicated to their profession, work long hours, are aware of their responsibilities, and proudly practice an historical code of ethics. When their mode of operation was criticized, like us, they responded with an immediate defense of themselves and their work, assumed the stance of the persecuted, overreacted to the charges, and accused the government of attempting to take away their freedoms and even to take over the industry. Of course they had much better audience exposure for their response than we did.

Like the doctors, in retrospect, they are missing the over-view; they are overlooking the big picture. They do not appreciate the significance of the majority of public opinion, which is difficult to measure in strength because of political overtones. Obviously *the people* are trying to say something. The television newsmen are missing the real message —there is something disturbing about the operation of the news media. There are frightening potentials of the influence of television in modern America. Many Americans are worried.

Sports Illustrated is an excellent magazine. Reports of athletic events and personalities are interesting, witty, beautifully composed—and accurate. Most of all, readers appreciate the coverage because each sport is handled by an expert. William Johnson, one of these talented experts, in a January issue writes on "Television and Sport." In a discussion of composition and presentation of the telecast, "a demanding, maddening world of split-second decision and instantaneous creativity," he has high praise for the ability of the directors and producers. These are men with a super talent. They are a new type of artist and composer. "They are creatures of their medium . . . . Nothing they do is lasting. Their craft is like painting with smoke. They contrive from their own sense of esthetics, reflexes, and knowledge the television version of an event, *and for millions that version is the event. Reality is only what appears on the tube. Anything the camera does not capture never happened.*"

Mr. Cronkite and all, *that* is what worries us. We are living in a new and different world, complex, crowded and disturbed. Many, many more people are exposed to television and radio than were ever exposed to the old hometown newspaper. Recitation of the high principles and good works of the news industry is as irrelevant to this present criticism of the media as were the Hippocratic Oath and the undeniable good intentions of the doctors to the problem that confronted medicine a few years back. Your immediate and human response to your critics is inadequate. If it wasn't on the tube it didn't happen! Take an unemotional objective look at this staggering responsibility.

THE COMMONWEALTH FUND, a philanthropic foundation based in New York, has announced the election of Dr. Robert J. Glaser as Vice President. Dr. Glaser has been a member of the Fund's Board of Directors since May. Many colleagues will remember him as Dean of the University of Colorado School of Medicine. Presently Vice President for Medical Affairs at Stanford University and Dean of the School of Medicine, Dr. Glaser will join the Fund's staff on September 1, 1970.

Dr. Glaser to be Vice-President of the Commonwealth Fund

The Fund is one of the country's principal foundations concerned with strengthening health opportunity in American life. Since its establishment in 1918, it has appropriated nearly $160 million primarily for this purpose. Quigg Newton, the Fund's President, was Mayor of Denver prior to becoming President of C.U. As Vice President, Dr. Glaser will have major responsibility for planning and directing the Fund's program, which is devoted to the advancement of medical education and the improvement of the nation's systems of medical services.

Dr. Glaser served as 1968-69 Chairman of the Association of American Medical Colleges, and is a member of the Board on Medicine of the National Academy of Sciences. Most recently, he was appointed to the Task Force on Science Policy, established by President Nixon to prepare recommendations for the future development of the federal government's role in science affairs. At Stanford, which he joined as medical Vice President and Dean in 1965, he helped the School of Medicine to continue and advance its standing as a foremost center of advanced research, educational innovation, and studies and experimentation in health care. Under his leadership, Stanford has launched pioneering studies on the functions and designs of hospitals and other health facilities intended both to limit costs and improve patient care. During the previous six years—1957 to mid-1963—he headed the University of Colorado School of Medicine as Dean and also Vice President for Medical Affairs.

Should every hospital have its own coronary care unit?

"Look Before You Leap"

Jacobus H. Verhave, MD, Clovis, New Mexico

THIS IS AN IMPORTANT QUESTION and a controversial issue in small communities. One of the pioneers of the Coronary Care Unit (CCU), Day,[1] who called his unit "Intensive Coronary Care Area," reported a decrease in mortality by clustering patients with acute myocardial infarction in special care areas. These units were designed for continuous monitoring of the EKG's and prompt treatment of serious arrhythmias and cardiac arrest during the first three to five days after the onset of acute myocardial infarction. Lown[2] reported that segregation of patients with acute myocardial infarction in a specialized area in the hospital decreased the death rate from this condition from 30 per cent to 40 per cent to an over-all mortality of 16.9 per cent. He reported these findings on 130 consecutive patients with proven acute myocardial infarction, admitted to the CCU at the large Peter Bent Brigham Hospital, Boston, Massachusetts. Similar favorable reports regarding the efficacy of CC Units have been published.

Lown[3] summarized four requirements for an effective CCU:

1. Individual rooms for patients in the proximity of a nursing station providing a noise-free environment.

2. Continuous monitoring of heart rhythm with automatic activation of audio and visual alarms when pre-set conditions have been altered.

3. It is essential to staff the unit with a cadre of well-trained nurses fully rehearsed in analysis of heart rhythm and mandated to initiate a number of therapeutic interventions.

4. It is necessary to evolve a coherent policy oriented to the prophylaxis of major arrhythmias and to the aggressive management of complications at their very onset.

Selzer,[4] Director of the Pacific Cardiopulmonary Medical Center, San Francisco, outlined more detailed requirements for CC Units and arbitrarily divided existing Coronary Care Units in four classes:

Class I: This represents the ideal unit, combining service with research. All facilities are available, not only monitoring and resuscitation facilities but facilities for the performance of all necessary chemical, physical and hemodynamic measurements. It includes provisions for emergency open-heart surgery (in case of ruptured septum or papillary muscle) and the 24-hour attendance of cardiologists or Fellows in cardiology on the premises.

Class II: This unit has many, but not all, of the facilities found in Class I units. Interns or residents are available around the clock, perhaps not in the area, but in the hospital.

Class III: This type of unit has monitoring facilities augmented by limited emergency laboratory facilities and a means of following central venous pressure in an institution without house staff but with part-time coverage by staff physicians.

Class IV: This is the minimal unit with an electrocardiographic monitoring system entirely staffed by nurses.

This classification demonstrates the wide difference among the various types of facilities covered by the general term, "Coronary Care Unit." Selzer warns against the possibility of over-treatment particularly in less

experienced hands. Drugs are not innocuous if improperly used and resuscitation procedures may be invoked in response to an artifact or a misinterpreted electrocardiogram and thereby harm the patient. The presence of a CCU may provide the physician with a false sense of security particularly in the case of a Class IV unit, where the exclusive attention is paid to arrhythmias, which represent only one of the many problems in patients with acute myocardial infarction. He considers statistics based on Class IV units, claiming reduction of mortality to one-half or one-third misleading and nonsensical because results are obviously slanted by other factors.

Considering the successful decrease of the death rate of patients with acute myocardial infarction admitted to CC units in big metropolitan and university centers, it is understandable that smaller hospitals want to compete with their big brothers. The electronic equipment of the CCU has become a status symbol and every hospital is proud of its unit and wishes to show it off. Overenthusiasm, local chauvinism and uncritical approach, together with stimulation of many electronic companies to take advantage of a virtually untapped market, claiming that a hospital without a coronary care unit is an obsolete structure, continue to push for a CCU, even in the smallest hospitals. This led to ineffective non-functioning CC Units. It should be recognized that the most important requirements of a functioning CCU are:

1. The 24-hour attendance of properly trained and retrained "cardiac" nurses.

2. The availability around the clock of physicians competent to treat cardiac emergencies.

These requirements cannot be met in a small hospital. Also smaller hospitals with a Class IV CCU offering coronary care may be more vulnerable medical-legally than a hospital without a CCU. It should be understood that medical hardware by itself is useless and that monitoring alone is an expensive and cynical way to see patients dying from acute myocardial infarction. Recently, Hubner et al.,[5] reported: "A mortality of 25 per cent for acute myocardial infarction was the same for a hospital without a coronary care unit where monitoring was routinely performed and for two neighboring hospitals which did not routinely use monitoring during the period of analysis."

Additionally, smaller hospitals run the risk that their coronary care beds will be empty frequently and that their "cardiac" nurses do not have the opportunity to maintain their skill. Therefore they should be retrained more often than their colleagues in a large hospital with a continuous influx of acute myocardial infarction patients.

Theoretically, a medium-sized community with three or four small hospitals could combine resources to establish one functioning Class III CCU. Knowing human nature, the problem then arises as to which hospital will have the privilege of having the CCU and thereby increase its prestige.

In view of the foregoing considerations, it is obvious that before buying any electronic equipment to be used in a CCU, a hospital must realize that 24-hour attendance in three shifts of competent physicians and properly trained nurses is the sine qua non of a truly effective coronary care unit. •

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Arteriography in abdominal trauma*

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In the past, arteriographic studies in patients sustaining trauma largely have been limited to study of the brain, the heart, the great vessels, and occasionally extremities. The extent and localization of abdominal injury is usually adequately evaluated by the clinical examination, four quadrant tap, laboratory data, and routine abdominal radiographic examinations. The potential value of arteriography as an adjunct in the management of the patient with abdominal trauma has recently been emphasized.[1] The procedure, via Seldinger technic is rapid and safe, and when positive, the findings are striking and obvious. Recent experience with selective visceral arteriography in patients with abdominal trauma prompted this report.

Methods

Patients were examined via the percutaneous trans-femoral route using the Seldinger technic with fluoroscopic TV image intensification. A #6 or #7 F. teflon end occluded catheter was used for aortic flush and a red kifa or triple curve "cobra" Ducor catheter for selective coeliac, splenic, and renal procedures. Conray 60 and Renografin 76 were the preferred contrast medias, and pressure injections were made with a Viamonte Hobbs automatic injector. Rapid filming was accomplished using a Sanchez Perez or Picker vacuum cassette changer. Photographic subtraction was adapted for visual radiographic enhancement. The average time for the diagnostic procedures was 35 minutes, and there were no complications.

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CASE REPORTS

CASE 1. A 31-year-old female was transferred to the Swedish Medical Center seven days after an evening of dancing and drinking. Her history was confused due to a partial amnesia. Examination upon admission revealed tenderness in the left upper quadrant, the hematocrit was 35. Four years previously she had experienced a prolonged complicated recovery following pelvic surgery with a pelvic and abdominal wall abscess, wound dehiscence, and pulmonary emboli. Two hours after admission, percutaneous trans-femoral selective splenic arteriography revealed the following: splenic enlargement, displacement from the lateral abdominal wall by perisplenic hematoma, stretching of splenic vessels, smudging, and loss of definition of the upper pole contour indicating rupture (Figs. 1 & 2). At surgery, a ruptured spleen was confirmed as described with a large perisplenic hematoma, and 1000 cc. of blood in the peritoneal cavity. She was discharged on the eleventh postoperative day.

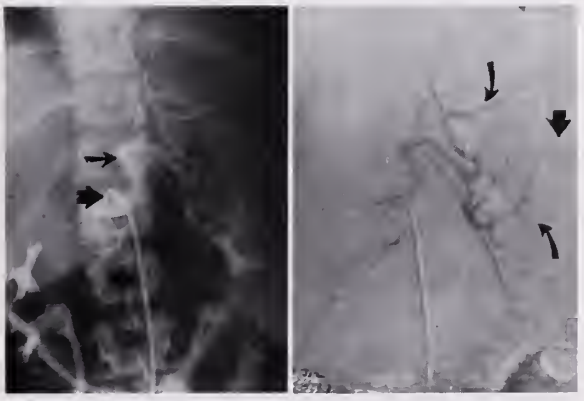

Fig. 1 (Case 1)—Left: Selective splenic arteriogram. Large black arrow: selective splenic arterial catheter. Small black arrow: splenic artery. Right: Same case, subtraction print. Curved arrows: splenic enlargement and stretched intrasplenic vessels. Black arrow: splenic displacement from lateral abdominal wall.

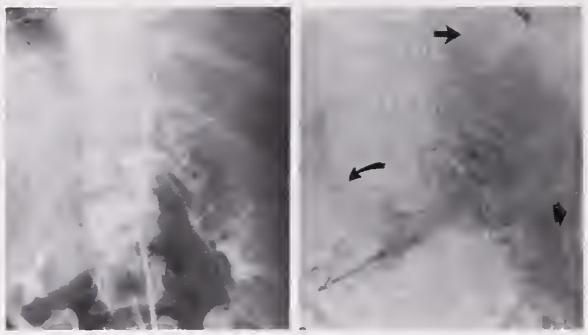

Fig. 2 (Case 1)—Selective splenic arteriogram, later phases. Left: Splenic enlargement and stretched vessels. Right: Capillary splenogram phase. Upper arrow: rupture of upper pole with stain, smudge and loss of distinct contour margin. Lower wide arrow: distinct, lateral splenic margin. Curved arrow: portal vein.

Fig. 3 (Case 2)—Selective splenic arteriogram. Top: Black arrow: splenic artery. White arrow: Extravasation, smudge, and stain at upper pole. Bottom: Black arrow: Stain and smudge persisting in area of contusion.

CASE 2. A 21-year-old logger was admitted with pain in the left lower chest and shoulder following trauma received from a falling tree. Physical examination revealed left upper quadrant tenderness without palpable mass. X-rays were negative, hematocrit 54. During a six-day observation, clinical signs and hematocrit remained stable but intermittent left shoulder pain persisted. On the seventh hospital day, percutaneous transfemoral splenic arteriography demonstrated a normal-sized spleen with upper pole contusion and a parenchymal extravasation stain. (Fig. 3) At surgery, an upper pole subcapsular hematoma and contusion with two additional small hilar splenic lacerations were found. The spleen was removed. The patient was discharged on the seventh post-operative day.

CASE 3. A 53-year-old roofer was admitted following a fall of over 15 feet. Tenderness was present in the left upper quadrant and there were several left lower rib fractures. Hematocrit was 40 and remained stable over the next ten days of observation. A troublesome adynamic ileus persisted however. On the eleventh day, percutaneous selective splenic arteriography showed an area of smudging and stain indicating splenic contusion and an additional pool of contrast media thought to probably represent a traumatic aneursym. No pathologic vein filling was seen (Fig. 4). At surgery, the external surface of the spleen was normal but a deep induration was palpable. Upon removal, pathological examination revealed a small congenital arterial-venous malformation with adjacent parenchymal laceration, hemorrhage, and necrosis, presumably due to traumatic infarction. The patient was discharged on the eighth post-operative day.

Fig. 4 (Case 3)—Selective splenic arteriogram. Top: Black arrow: splenic artery. White arrow: pool contrast material interpreted as traumatic pseudoaneurysm and contusion found to be small A-V malformation with adjacent laceration and contusion and traumatic infarction (see text). Bottom: Photographic subtraction.

CASE 4. An 11-year-old boy was admitted shortly after being kicked in the left flank by a horse. On admission, there was left lower chest and upper abdominal tenderness and gross hematuria. Hematocrit was 46 and two days later was 43. Intravenous pyelogram demonstrated lower rib fractures and decreased visualization of the left lower pole. Two days after admission, selective splenic and renal arteriography showed a small area of central splenic contusion. The kidney, however, showed an abnormal nephrogram in the left lower pole and an adjacent arterial-venous fistula (Figs. 5 & 6). He was observed and discharged to return for follow-up arteriography for the renal abnormality.

CASE 5. A 10-year-old female was admitted following a 5-foot fall from a playground monkey bar. Left flank and upper abdominal pain was present and there was gross hematuria. Hematocrit was 36 and twenty-four hours later was 31. Intravenous pyelogram showed decreased visualization of left renal collecting system without extravasation. Five days after admission, aortography and selective coeliac and left renal arteriography showed a normal spleen and an area of renal contusion without evidence of arterial-venous fistula formation (Fig. 7). She was observed for six additional days and upon clearing of the urine was discharged to return for follow-up arteriography studies.

Fig. 5 (Case 4)—Selective splenic arteriogram. Black arrow: area of contusion with stain and smudging.

CASE 6. A 60-year-old plumber was admitted following a fall from a roof. On admission, severe abdominal and back pain with restlessness prohibited detailed reliable clinical examination. There was moderate hematuria. X-rays showed partial compression of L-3 and an intravenous pyelogram revealed a poorly demonstrated left renal contour and collecting structures. One day after admission, aortography and selective renal arteriography showed no apparent abnormality of the spleen or kidney. The patient was observed and treated for the vertebral fracture.

Fig. 6 (Case 4)—Selective renal arteriogram. Left: 2 seconds after injection. White arrows: selective catheter. Right: Subtraction print. Top wide black arrow: normal nephrogram. Lower curved arrow: deficient lower pole nephrogram. White arrow: traumatic A-V communications. Straight black arrow: early filling of renal vein.

Fig. 7 (Case 5)—Selective left renal arteriogram. Curved black arrow: selective catheter. Straight black arrow: normal renal contrast nephrogram. Curved white arrow: absent nephrogram of lower pole, area of contusion.

Discussion

In the absence of other significant injuries, acute traumatic rupture of the spleen with massive intraperitoneal hemorrhage usually offers no diagnostic problems. In a substantial number of patients with splenic trauma, however, other injuries are present which mask the features of splenic trauma. Coincidental renal contusion or laceration, with left upper quadrant pain and hematuria may cloud the clinical picture and obscure splenic injury which, if present, could lead to delayed rupture. Additionally, once the possibility of splenic trauma is considered, careful prolonged hospital observation is mandatory, if the complications of delayed rupture are to be averted.[6] In this group of patients, in whom the diagnosis of splenic trauma is in doubt, arteriography can aid accurate diagnosis and afford prompt surgical treatment (Cases 1, 2, & 3) or more confident conservative management (Cases 4, 5, & 6).

The arteriographic diagnosis of splenic injury depends upon demonstration of direct or indirect signs.[7]

DIRECT SIGNS

1. Irregular collections of contrast material in the spleen parenchyma representing pools of extravasated contrast material. These smudges appear in the arterial phases and may persist into the venous phase. (Figs. 3 & 5).

2. Distortion of the normal homogenous "spleenogram" or capillary phase with mottled areas devoid of contrast material (areas of hematoma), with break or loss of the normal smooth contour margin of the spleen. (Fig. 2).

3. Early opacification of the splenic vein (before five seconds) indicative of small-arterial-venous shunts.

4. Loss of normal tapering of arterioles or abrupt terminations of these vessels at extravasation site. (Fig. 3).

INDIRECT SIGNS

1. Stretching of intra-extrasplenic vessels by non-opaque hematoma. (Fig. 1)

2. Splenic enlargement. (Fig. 1)

3. Displacement of the spleen from the diaphragm or lateral abdominal wall or displacement of other organs (stomach or kidney). (Fig. 1)

The most reliable changes appear to be those related to extravasation of contrast material and loss of the normal splenogram.[5]

It is of interest that one of the patients examined primarily for splenic injury also had a significant renal abnormality (Case 4). One patient examined primarily for renal evaluation had a splenic abnormality (Case 5). The classification, significance, and implications of the arteriographic findings in renal injury is currently under review study, and it is hoped that prognostic and therapeutic guidelines utilizing arteriography will be forthcoming.[5]

No cases of liver trauma were encountered in this small group of patients, but the frequency of liver injury and benefit or arteriography has been reviewed elsewhere.[3,2]

Summary

Six patients sustaining abdominal trauma were examined with selective arteriography of the spleen and kidney. Selective visceral arteriography is a prompt, safe, reliable adjunct in the management of patients in whom visceral trauma is suspected. •

Addendum:

Subsequent selective splenic and renal angiography three months after injury on case No. 4 demonstrated that the splenic and renal abnormalities had completely resolved without residual abnormalities on angiograms.

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Interaction: Physicians, Medical institutions, society*

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I AM PLEASED to have been invited to join this Conference and to deliver the opening address and am particularly pleased to be in Colorado again. In the past year I have spoken to the Colorado Medical Society, the Colorado-Wyoming Directors of Medical Education, the Staff of Children's Hospital, the Brookings Institution Seminar on Public Policy for Medical Care and Medical Education. In these visits I have come to know a number of you engaged in the field of health care and health education and have formed a high opinion of your interest and dedication to the goal of providing excellent health care to the citizens of your region. Congratulations upon your initiative. My remarks will reassure you that you are embarked upon the right course.

There is no physician who has made so great a contribution to his profession and to society's well-being as has Ward Darley. He was overly kind in his introduction, but it reflects a mutual and affectionate regard. To another old friend, Dr. Kenneth Sawyer, we owe a debt of gratitude. In his important roles in the American Medical Association and its Council on Medical Education, he has given me great encouragement and support.

My remarks are billed as the "keynote address." I have never been absolutely sure of the meaning of that phrase. It has connotations of oratory of which I am not capable. It has connotations of wisdom that I do not possess. I shall assume that my task is to state the basic concepts which are involved in this Conference, define as completely as possible the most important words we are using, and, finally, suggest some priorities for consideration. The title of the Conference is "Interaction: Physicians, Medical Institutions, Society." The word of paramount importance is "Interaction" and I propose to concentrate upon it. The title of my remarks, therefore, is "Action, Reaction, and Interaction."

Definition

I shall begin with a definition of interaction. Many people would define the word and the concept by a simple algebraic equation thus:

Action + Reaction = Interaction

This is a dangerous fallacy and is no more true than the statement that two oranges plus five apples equal seven bananas. The point is that action and reaction are *events* and interaction is something different. The concepts of action and reaction arise from Newton's Third Law of Motion. "To every *action* there is an equal and opposite *reaction.*" The sum of the two is zero—that is, action and reaction cancel each other.

I realize that the concepts concern the motion of inanimate objects and not human behavior. Yet human behavior is extremely similar. A person acts, another reacts. With rare exceptions the reaction is opposed to the action and frequently is so nearly equal in its energy that the result is a stalemate. But whether they be opposite or not, equal or not, human action and reaction are always events. In contrast, *interaction* is not an event —it is a *process.* Action and reaction are frequently instinctual and emotional; interaction is rational and moral.

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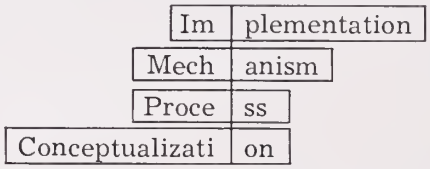
Now, I ask you to concentrate upon the definition and concept of *process*. I will define it as the means by which man translates rational and moral wish into constructive *action*. To create the concept, it must be thought of in the context of logical relationship to other intellectual steps. There is a four-step logical procedure by which we identify and solve problems in a rational way. These four steps are:

1. Conceptualization
2. Process
3. Mechanism
4. Implementation

This can be represented graphically in this fashion:



If this order is not followed, we are prone to leap rapidly to erroneous conclusions. In the diagram I have drawn a vertical line as an axis in order to remind us of a basic fact of human behavior. The length of each rectangle to the left of the vertical line represents the relative importance or priority of each step. The length of the rectangle to the right of the vertical line represents roughly the proportion of any group of people that you can get to involve themselves in that particular step. This is to say that while conceptualization is the first and most important step, very few members of any human group have any taste and talent for it. By contrast, in implementation (or, as I sometimes call it, the nuts and bolts), everyone is interested and insists on involvement. As a result, we all too frequently make the nuts and bolts the first order of business when it really should be last. In my experience I have had great trouble in getting a university faculty to take the time and make the effort to conceptualize the goals of education or the nature of a curriculum. In contrast, everyone is deeply interested and extremely vocal when it comes to such questions as: What will I do on Tuesday afternoon? What secretarial service will I have? and, Where am I going to park my car?

Now to the business of this Conference: I am convinced that the step of conceptualization has been completed. We are agreed that the American people are to have good health care. We have taken the decision that health care is a necessity to be included with food, clothing, shelter, and education, and not simply a privilege to be enjoyed by some. We have enacted laws which clearly view health care as a right. We now have the task of finding the process and then the mechanism which will implement this decision both rationally and morally. Again, I emphasize that we are at the step of process. If we fail to give our undivided attention to it, we shall leap to nuts and bolts and fail to achieve the goal. I would remind you of the roots of the word "process" — "pro," meaning *forward,* and "cedere," meaning *move*. Process is the act of moving forward and the prerequisite is interaction.

There are three ways that we can pair physicians, medical institutions, and society in considering the process of interaction: the interaction of physicians and medical institutions, the interaction of medical institutions and society, and the interaction of physicians and society. I shall try to address myself to each pair in turn.

Physicians and Medical Institutions

The interaction of physicians and medical institutions has been strongly affected by the revolution in medicine during the past fifty years. These years have seen the development of the science of medicine to undergird the art of medicine. The revolution in medical education precipitated by the Flexner Report insured this. Medical education was taken from the apprenticeship environment of the separated and frequently proprietary medical school and placed in the environment of the university. There it was subjected to the influence of science and to human curiosity in research. It was centrally involved in the knowledge explosion. The knowledge explosion produced specialization and specialization is the central feature of the changed relationship of physician to medical institution. There is a clear and logical set of consequences following any major increment in man's fund of knowledge. Increasing

knowledge makes it difficult and soon impossible to master all that is known in any field. Thus, the individual is forced to make a choice as to the portion of the field which he will attempt to master, and, in doing so, becomes a specialist. Specialization results in a division of labor. The division of labor requires organization. Organization requires institutionalization for the delivery of service.

I can cite many examples of this clear relationship. In the industrial area, I simply remind you that the one- or two-man machine shop has been replaced by the huge corporation to manufacture everything from automobiles to television sets. In the area of government, I point to the institutionalization of services at all levels—local, state, and federal. In the health field, I point to the rapid rise of group practice, to the growing centrality of the hospital as the locus for the delivery of medical care, both to bedded and to ambulant patients, to the remarkable change of the emergency room from a true emergency facility to the community's only health care dispenser open twenty-four hours a day and seven days a week.

While the practice of medicine has become marked by the mutual interdependence of differentiated physicians, the hospital has not shown the capacity for rapid change which would let it become truly the institution of health care. Rather, it has remained the locus of medical cure which is becoming a smaller and smaller part of health care. This statement is not intended to be a criticism of hospitals, but simply a statement of fact. Hospitals, like virtually every other human institution, including universities, churches, and governments, were organized for permanence, not for change. Now that they are under great pressures created by circumstances outside their control, they lack the capacity for what John Gardner has described as "self-renewal."

The interaction of physician and medical institution that is required is a very unusual one. We have no models in our society to follow. Industry has managed its self-renewal by institutionalizing in most imaginative and flexible ways. Corporations have profited greatly by the skill and knowledge of highly specialized people. However, this has been a very successful institutionalization for the production of *things*. There is no parallel model of success for the production of *services* which require a one-to-one human relationship as in health or education. I stress this point by stating that in buying a car, I don't care to know the name or the education of any one of the thousands of men who designed and built it. But, in selecting a course of study, I am deeply concerned about who the teacher is. If I must have surgery, I am deeply concerned about who the surgeon is. What is needed is the most concentrated attention upon the invention of a new institutional form which will be the agency for delivery of health care by a vast array of differentiated health workers and still insure that the service is given to individuals on a one-to-one basis.

Medical Institutions and Society

The second interaction we are concerned with is that of the medical institution and society. The chief medical institution, the hospital, has evolved over the decades in response to special forces and not to societal forces. It began as a simple charity to shelter the homeless, the infirm, and the neglected. As the technology of medicine grew, it became the locus for the delivery of a doctor's skills to his seriously ill patients. It has been well characterized as the "doctor's workshop." At the same time it was necessary to move the education of various health professionals from an apprenticeship to an institutionalized setting of clinical education. Thus, the hospital became also an educational institution. During the same time period, society has undergone a very basic change in its attitude toward health care because of social, economic, and political changes. This I have already described as a change from viewing health care as a privilege to viewing it as a basic human right and a basic necessity of life. Society also views health care as being delivered both by the physician and by the hospital as a corporate body. But, society has not yet decided which of these is ultimately responsible. It is the nature of a right that it is guaranteed by law and that it is enforceable at law. If a right is enforceable at law, the question arises as to

whom I can sue if I am denied that right. In this case, do I sue the government which guarantees me Medicare or do I sue the physician who renders the care, or do I sue the hospital which is the institution of medical care? My guess is that one would sue either the physician or the hospital and not the government. Here, then, is the crux of the interaction of physician and institution, and I believe that the institution will be selected as eventually responsible. I base this on the fact that there are two worlds in health care —cure and care. Cure is probably 25 per cent to 30 per cent and care is 70 per cent to 75 per cent of health care. The physician is largely concerned with cure and the hospital with care. Society is more concerned with care and, therefore, is becoming saddled with the enforceable responsibility for providing it.

This means to me that the hospital must get busy with the task of adaptation so that it can meet the responsibility. In short, it must become an adaptive institution which recognizes its role as a corporate entity providing health care as well as the locus in which individual physicians provide cure for illness and disability.

Physicians and Society

The third interaction with which we are concerned is that of the physician and society. I start by reminding you of the historical fact that for many decades there were two distinct worlds—those of *public* health and *private* health. The world of public health was essentially that of government and it was concerned with environmental matters and the well-being of groups of people and not with caring for individuals. The world of private health was concerned with individuals and involved the person-to-person relationship of a physician and a patient. Today this distinction is not valid. Government has assumed responsibility for the direct health care of many individuals, members of the armed forces and their dependents, veterans, the Indians, and many more. Government has assumed financial responsibility for the health care of millions of individuals through Medicare and Medicaid. Now government has assumed large responsibility for planning the system for the delivery of health care. Where formerly the physician's relationship was only with a patient as an individual, today his relationship is also to many social institutions: government, third-party payers, industrial corporations, unions, and voluntary associations. This is a bewildering world to the physician who must now interact with society and with society's institutions. The die is cast and we are faced with the absolute necessity for rational and moral interaction. It must not be action and reaction. There must be process and not a series of unhappy events.

Conclusion

In conclusion I would remind you that the process of interaction is not accomplished in a single meeting or in a series of meetings. Rather, it must be a way of life and of continuing effort. It must be intellectual and not emotional. Interaction in the health field is an uncharted and unfamiliar path. Its negotiation requires invention and creativity. This Conference can be the beginning of such an interaction, of such a process, from which can flow reliable and efficient mechanisms, and eventually the realization of hopes and aspirations. I hope that your deliberations will lead to the next steps and that you can move toward the promise of the future and provide health care of excellence and ready availability to the citizens of your area. •

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Diagnosis and management of acute renal failure*

Presentation: L. C. Calodney, MD, Intern, Department of Medicine
Discussion: Robert Whang, MD, Associate Professor, Department of Medicine

Case Presentation

Dr. Calodney: The patient is a 48-year-old white, married man, who had been in excellent health all his life, except for episodes of furunculosis occurring about every three years. On July 2, 1969 he was admitted to another hospital following an episode of left anterior chest pain and diaphoresis, and diagnosis of acute myocardial infarction was made on the basis of electracardiographic and enzyme criteria. He was transferred to the Albuquerque Veterans Hospital on July 7, having had an uneventful course. Laboratory values on admission included hemoglobin 15, hemotocrit 46, WBC 5,500, platelets 205,000, BUN 22, Na 138 and K 3.9. The only medication he had received was Quinidine.

On the 16th and 21st of July, and on August 1st, he had extensions of his myocardial infarction documented by electrocardiograph. On July 20, Quinidine was stopped and Heparin and Procaine Amide were begun. Throughout this period electrolytes, BUN, CBC, intake and output remained stable and within a normal range. Between August 1 and 6 he developed a furuncle of his buttock, and suffered several episodes of intractable chest pain. On August 9 he went into congestive heart failure, with prolonged periods of hypotension and bradycardia. Procaine Amide was stopped, and the failure treated successfully with digitalis and diuretics. Culture of the furuncle had grown coagulase positive staphylococcus, but it had disappeared without treatment nor a febrile episode.

On August 24, he suddenly had a shaking chill and his temperature rose to 104°F. Keflin was started pending results of blood cultures. Lab values included hemoglobin 14.5, hematocrit 44, WBC 7,200, platelets 88,000, BUN 47, creatinine 2.1, Na 132 and K 3.8 Measurement of intake and output was reinstituted. By August 27 hemoglobin and hematocrit had dropped to 10.2 and 30 respectively, WBC to 3,500 and platelets to 31,000; BUN and creatinine had risen to 90 and 7.6; intake was 2,100 cc. but output was only 120cc. Urinalysis, which had been normal on admission, now revealed many RBCs and RBC casts. Blood cultures yielded the same coagulase positive staphylococcus. Keflin was stopped and Methicillin and Hydrocortisone 300 mg Q.D. were started. Between August 27 and September 2 the patient was transfused with two units of blood, and on the latter

*Prepared by William S. Curran, MD, Assistant Scientific Editor for New Mexico, Albuquerque, New Mexico.

date the hematocrit was 33, platelets 69,000, BUN 240, intake 500 cc and output 710 cc. Peritoneal dialysis was begun the next day. Methicillin was stopped and Keflin restarted. Over the next 48 hours, 29 exchanges were made at the end of which the BUN was 105; electrolytes within normal limits; the output averaged 630 cc per day.

On September 9 the patient began having guaiac positive stools, which have continued until the present time. Hematocrit was 30.5, platelets 59,000, BUN 162, creatinine 17.4, Na 129, K 3.6, urine Na/K/35/31, osmolality serum/urine 337/335, and output was 775 cc. Hydrocortisone was decreased to 175 mg. q.d. By September 15 the hemoglobin had fallen to 8.8 and the hematocrit had fallen to 28.5 and two more units were transfused. Platelets had risen to 114,000, the BUN to 204 and the creatinine to 16.8; Na was 121, K 3.2 and output was 1,180 cc. Dialysis was again considered, but on September 19 the BUN fell to 149 and the creatinine to 10 and output was 2,300 cc; platelets were 76,000. Hydrocortisone was changed to 300 mg. q.o.d. From this point the patient continued to improve, the output stabilizing around 2,000 cc; BUN between 60-80 and the creatinine from 4-5. The patient lost the nausea which had plagued him during the period of azotemia, and began eating with gusto. Electrolytes returned to the normal range, and platelets rose to 150,000. Urine sediment now shows only a few RBC and hemoglobin clumps. Heparin has been discontinued, the Hydrocortisone has been changed to Prednisone 40 mg. every other day, and he is doing well.

Discussion

Dr. Whang: It is apparent that this is a complex case and I would like to begin by commending the housestaff on the care that they have given this patient. It is by virtue of their hard work that we have been able to see and talk to him this morning.

I would like to divide this discussion into two parts. First, I will go directly to a discussion of some of the clinical aspects of acute renal failure. Secondly I will relate some of these problems and considerations to our patient.

One of the first questions that is asked of a consultant regarding a patient who is exhibiting oliguria with urine volumes less than 400 cc/day is: "What is going on?" This is a reasonable and logical question because if one can ascertain what is going on perhaps then one can direct therapy appropriately. Another way of phrasing the same question would be to ask: "What are the reversible causes of renal failure?" From the patient's point of view it is important to ask the question in this manner because as far as he is concerned, the reversible causes of renal failure are most important to him. If appropriate therapy is undertaken then his chances of recovery are immeasurably improved. With this in mind we can begin with a consideration of reversible causes:

First of these, because of its relative frequency, is congestive heart failure. Both glomerular filtration rate as well as renal plasma flow can be significantly diminished in the presence of clinical congestive heart failure. When appropriate measures are taken to relieve the congested circulation these abnormalities disappear.

Second, causes of renal failure related to infection should be considered such as acute pyelonephritis. Acute bacterial endocarditis or subacute bacterial endocarditis also belong in this category.

Third, and again very common, is apparent renal failure related to water and electrolytes imbalances as well as blood volume depletion. Examples of this are very commonplace—the patient who presents with salt water deprivation or perhaps the patient with a bleeding peptic ulcer who is hypovolemic.

Fourth, I would include any of the clinical causes of hypercalcemia. If hypercalcemia is detected early enough and corrected, the renal functional abnormalities that result from a sustained hypercalcemia can be reversed.

Fifth, potassium depletion must be considered. It is well known that with simple potassium depletion the finding of accompanying azotemia is indeed frequent and that with repletion of potassium not only is the azotemia diminished, but also the morphologic abnormalities associated with hypokalemic nephropathy are reversed.

There are three other causes of reversible renal failure which should be mentioned. Acute glomerulonephritis is not a real consideration in this case. Neither is acute tubular necrosis or obstruction, due to prostatic hypertrophy or some other cause. As you look at this list, it may or may not include the patient who is oliguric, but nonetheless consideration of these causes of reversible renal failure would insure that the clinician would not overlook any of these possibilities.

I would like to then move on beyond the history and physical examination to some of the laboratory examinations useful in assessing the oliguric patient, as well as the rationale for these studies. I think there are a number of ways of approaching this problem. When faced with a patient with oliguria perhaps the initial consideration should be made as whether or not there are prerenal or intrarenal causes for the oliguria. In approaching the oliguric patient in this manner, there are certain studies that help in the discrimination of urine osmolality and urine sodium.[1] With prerenal causes of oliguria, and perhaps the prototype would be water deprivation, the renal response to the contracted state would be to elaborate a small volume of highly concentrated urine in response to enchanced ADH secretion. As

a consequence of the water deprivation with resulting hypovolemia, another hormone is brought into play in addition to the ADH, namely aldosterone. In response to the enhanced aldosterone secretion urinary sodium concentration is diminished. Thus, urinary sodium concentrations of less than 10-20 mEq/L and an osmolality of 400 or more would be consistent with the renal response to dehydration.

In contrast to the water deprived and volume contracted patient, the patient with overt acute tubular insufficiency elaborates urine which is isotonic with an osmolality of approximately 300 and in contrast to the volume-contracted patient who is avidly retaining sodium, another reflection of impaired renal function is loss of sodium into the urine, generally exceeding 50-60 mEq/L. The importance of differentiating prerenal from intrarenal causes of oliguria lies in the fact that therapy is drastically different in these two instances. It is as bad to restrict water in the patient who is suffering from water deficit as it is to administer fluids to the patient who has acute tubular necrosis. Dr. Barry and his group suggest that the infusion of hypertonic mannitol in an initial dose of 12.5 grams intravenously quite rapidly, and repeated once if necessary, may help in this differential diagnosis.[2] With infusion of 25 grams of mannitol in the presence of no renal parenchymal damage this osmotic substance would induce a diuresis. Thus, if one perceives an increase in urine volume up to 40 mls per hour, the chances are good that the oliguria is related to prerenal causes. In contrast, if very little response is seen to mannitol infusion, intrarenal causes for the oliguria should be considered. Recently a group reporting from Rochester, Minnesota have made the point that combining mannitol with ethacrynic acid, a very potent diuretic, may be of additional help in managing patients with renal failure.[3] They reported cases of apparently established renal insufficiency who responded to this therapy, thereby averting the oliguric phase of acute renal failure.

The technic of assessing renal blood flow isotopically pioneered by Dr. Barger and his group is germane to this discussion.[4] Working with dogs and using the technic of autoradiography they found that with the intra-renal arterial infusion of radioactive Krypton the cortical areas were initially perfused. In the second phase the isotope reaches the corticomedullary portion, then the deep medullary portions, and finally in phase 4, the perirenal fat. It has been demonstrated that the washout curve for radioactive Krypton closely approximates renal perfusion and blood flow. Renal cortical ischemia as demonstrated by the washout curves characterized impaired renal perfusion such as in a dog with induced tricuspid insufficiency and congestive heart failure. In contrast, return of cortical perfusion would be evidenced by diuresis and sodium excretion. I think this data is fascinating. The group in Boston headed by Dr. Merrill has applied the technic clinically and studied 20 oliguric patients, using a different isotope,[5] radioactive xenon. Their data is very similar to the earlier laboratory observations. In a variety of patients exhibiting renal failure including patients with diagnoses of acute tubular necrosis, acute glomerulonephritis, and so forth, they were able to demonstrate the presence of cortical ischemia by this technic. It is interesting that the surgeons performing open renal biopsies in oliguric patients also found the renal cortex relatively bloodless, encountering blood only as they penetrated the deeper portions of the kidney. My point is that perhaps we have, just beyond the horizon, an additional diagnostic tool, and that is all this is in terms of assisting us with our patients in making differential diagnosis of what might be going on when a patient is exhibiting oliguria. I believe that if these technics can be refined and made readily available that this would represent a significant step forward in the clinical diagnosis and management of oliguric patients.

In touching briefly on the question of therapy, I would like to call your attention to Dr. Merrill's article which well summarizes this aspect.[6] However, there are some problems in management of patients with renal failure which deserves mention. First of these is the problem of overhydration. Like many things in medicine, it is better to prevent the problem. By closely monitoring intake and output and allowing for perhaps a pound or so a day of weight loss the likelihood of encountering overhydration is minimized. I should point out

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that the rule of thumb of a pound per day weight loss is predicted on the earlier experience of maintaining patients primarily on intravenous fluids supplemented with carbohydrate. Perhaps this will be modified as more experience is gained with feeding patients during acute renal failure. I am alluding to the study done by Berlyne and his group where in a very small number of patients with acute renal failure they examined the question as to whether or not a patient would do better if he were fed during the period of oliguria.[7] Patients fed a modified Giovanetti diet during the oliguric phase did not require more frequent dialysis. The fed group had less nausea and vomiting and a better nutritional status. The particular diet used by Berlyne provides 2,000 calories, 500 cc of water, 15mEq of potassium, and 10 mEq of sodium per day. Thus, it is rather restricted in sodium potassium and water, but is calorically quite adequate.

Secondly another problem that is commonly encountered in patients exhibiting renal failure is hyperkalemia. Here again we make great efforts to circumvent this problem. We restrict potassium intake drastically and attempt to ameliorate the catabolic response to renal failure by providing calories. By ameliorating the acidosis we promote the movement of extracellular potassium into cells. If, in spite of all these efforts, hyperkalemia supervenes there are other measures which can be utilized. A sodium cycle exchange resin is quite effective in the therapy of hyperkalemia.[8] However, there is a drawback and this is the point I would like to make. With the exchange of potassium one accepts sodium in return and in a patient who is shut down and unable to maintain sodium balance significant increments of sodium may accumulate. Berlyne has reported congestive heart failure and severe hypertension most likely ascribable to the positive balance of sodium resulting from the administration of the sodium cycle resin.[9]

Thirdly, acidosis can be very nicely managed with sodium bicarbonate, again the limitations being the amount of sodium administered in this particular instance. There are other problems, such as infection, which constitute the major cause of death in patients with acute renal failure.

Fourth, the uremic syndrome should be mentioned as another complication of renal failure. We are all aware of the nausea, vomiting, gastrointestinal bleeding, mental obtundation, pulmonary changes as well as other abnormalities which characterize the uremic syndrome. Thus, by discussing some of the complications of acute renal failure, we have arrived at the indications for dialysis, namely over hydration, hyperkalemia, acidosis and the uremic syndrome.

I would now like to return to our patient. When we saw him we considered several possibilities to account for the rather dramatic rise in BUN and creatinine. This was a patient who incurred a significant insult to his myocardium, who in fact suffered several recurrences of this problem, and who at one time was hypotensive. One possibility to account for his renal failure was that during hypotension and diminished renal perfusion he developed acute tubular necrosis. The other possibility that was considered was that the acute renal failure was a manifestation of Methicillin therapy.[10] The majority of patients in Baldwin's series received 20 to 24 grams of Methicillin per day. In today's patient, therapy did not approach this dose level. In addition he did not exhibit the rash, fever and eosinophilia that accompanies this syndrome.

Could the renal failure then be a manifestation or an accompaniment of the staphylococcus septicemia? In general, any intravascular infection could potentially lead to renal failure. To rephrase this, if one sees a patient with renal failure one cannot afford to overlook the possibility of intravascular infection. Clearly our patient had staphylococcal sepsis. The experience from the Kaiser group reported recently in the Annals, made some subtle differentiations between their patients and the usual patient reported with intravascular infection.[11] Usually one anticipates focal glomerulonephritis with endocarditis. In the patients reported from California the glomerulonephritis morphologically was indistinguishable from acute poststreptococcal glomerulonephritis. This could have been the cause for the impaired renal function that our patient exhibited. A renal biopsy was considered but not performed because of the thrombocytopenia.

In view of the thrombocytopenia and sepsis could our patient have been suffering from intravascular coagulation with consequent clotting of the renal vasculature? Again, a renal biopsy would have been helpful diagnostically, but judged to be unwise to perform in this instance.

Finally, I would call your attention to the serum osmolality on this day which is clearly elevated. The serum sodium on the same day was approximately normal, and yet the serum osmolality far exceeds the normal 290 M osmole/Kg. This apparent paradox can be resolved by calculating the osmolality contributed by the excess urea which approximates 50 milliosmoles. In doing so the "corrected" serum osmolality is approximately 280. By recalling that urea is distributed throughout both the intracellular as well as the extracellular phases of body water the rationale for "correcting" or subtracting the osmotic contribution of urea becomes apparent.

Questions

Physician: On the Xenon scan can you distinguish between prerenal and intrarenal disease?

Dr. Whang: I think that it would depend on the clinical problem. This technic would be most helpful in the diagnosis of the oliguric patient who does not have evidence of blood volume depletion,

that is in a patient with a normal hematocrit who doesn't exhibit postural hypotension and where skin turgor is normal.

Physician: In the light of all the recent reports that intravascular clotting is very frequent with sepsis, what considerations were given to this possibility? The platelets would seem to be low the first day the patient was septic at a time that he was not hypotensive. I wonder whether just a short trial of heparin is enough to really warrant the conclusion that he was not undergoing intravascular clotting or did you do split products and the whole series?

Dr. Whang: We studied both the split products and measured fibrinogen levels. As is known, oliguria following an hypotensive episode may follow immediately after correction of the low blood pressure or may become manifest a day or so later. Perhaps Dr. Hardy would like to comment.

Dr. Hardy: The split products were measured in this man using both the ethanol gelation and protamine precipitation. In addition, the fibrinogen titer as well as other studies were normal so we really had nothing other than thrombocytopenia to substantiate this.

Physician: Why was hydrocortisone used?

Dr. Whang: The hydrocortisone was administered in the therapy of this patient's hematologic problem and perhaps Dr. Hardy might comment on that also.

Dr. Hardy: We were able to establish that he had a megakaryocytic form of thrombocytopenia and in that setting I think one is faced with three possibilities. Platelets are being sequestered as in an enlarged spleen which he certainly didn't have. The platelets are being consumed in the process of defibrination which was no evidence for, or one is left with, almost by exclusion, the probability that is an immunologically induced thrombocytopenia. We really didn't have any good drug history of commonly sensitizing drugs to account for the thrombocytopenia and therefore it was thought that it was possible that his thrombocytopenia was on an immunologic basis and this is why steroids were recommended. •

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Tumor Conference from University of Colorado Medical Center

Edited by Erick R. Ratzer, M.D.

PARTICIPANTS:

George J. Hill, II, MD—Assistant Professor of Surgery

Bing Johnson, MD—Assistant Professor of Radiology, Head, Division of Radiation Therapy

Richard M. Mulligan, MD—Professor of Pathology

Erick R. Ratzer, MD—Assistant Professor of Surgery

Dr. Ratzer:

The patient presented today is a 76-year-old white male with recurrent malignant melanoma of the left cheek. About two years before admission to Colorado General Hospital he developed itching and bleeding of a "mole" of the left cheek which had been present for years without any trouble. Fourteen months before this admission the lesion was removed and the histologic diagnosis of malignant melanoma was made. Re-excision was then done but no residual tumor was found. He remained well until two months ago when he developed a nodule in the previous scar. The nodule increased rapidly in size and two weeks ago another developed in the adjacent skin.

Examination revealed blue nodules 3.0 cm in diameter beneath the intact skin over the horizontal ramus of the mandible. No nodes were felt in his neck. Chest roentgenogram, skull roentgenograms, brain scan, and liver scan did not reveal any metastasis.

Surgical treatment of the recurrent tumor consisted of wide excision (including overlying skin), left superficial parotidectomy and left radical neck dissection. He is now five days following operation and doing fine. (Patient is now actually seven months following operation and is free of disease.)

Dr. Johnson:

His chest film shows two striking abnormalities. He has bilateral interstitial infiltrations more prominent in the upper lobes of the lungs. This is probably a pneumoconiosis rather than tuberculosis or granuloma. The other finding on his chest film is a prominent aorta. I would wonder if he has any history or physical findings suggestive of aortic valvular heart disease or arterial hypertension. However, against this would be a normal cardiac silhouette. Pulmonary metastases are not visible.

A skull series was done and there are several rarified areas scattered throughout the bone which have the characteristics of venous lakes rather than lytic metasatic lesions. In addition, metastatic malignant melanoma to bone where it is visible on an x-ray is uncommon, particularly in the asymptomatic patient. Bone marrow metastasis is not uncommon, however. Films of the mandible are unremarkable.

Metastatic bone survey (thoracic and lumbosacral spine, ribs, humeri, pelvis, femura), liver scan, and brain scan are normal.

Dr. Ratzer:

I think some mention should be made of this work-up because a case can be made for overdoing it. The metastatic bone survey was really a long shot, as mentioned. The liver scan for metastasis almost certainly would have been normal because the liver was of normal size and all the liver function tests were normal. In this situation the scan is of very limited use. The brain scan in an asymptomatic patient is also questionable. Doctor Johnson, would you comment on the limits of the scan and the use of the EEG in conjunction with it?

Dr. Johnson:

A tumor 1.0 - 2.0 cm in size can be detected with a brain scan. The scan is excellent for lesions in the substance of the brain, but it may miss smaller lesions near vascular structures or at the base of the brain. In the latter instance the EEG may be more reliable. Together the two studies have a high degree of accuracy. While a brain scan in a malignant melanoma patient with no CNS symptoms may be positive, the yield is going to be quite low.

Dr. Ratzer:

Doctor Mulligan, would you tell us about the histology on the operative specimen?

Dr. Mulligan:

We received an en bloc specimen consisting of a wedge of skin, the parotid gland, and the left cervical soft tissue.

The skin wedge was 10.0 x 6.0 cm and covered two lumps, both about 2.0 cm in diameter, and both of which were malignant melanoma deposits in the hypodermis. One of five parotid lymph nodes contained metastatic tumor. Thirty lymph nodes in the neck contained no metastaic tumor.

Here is a microscopic view of one of the nodules which illustrates the intra-epidermal origin of the tumor. In this section the malignant cells within the epidermis penetrate into the dermis. The malignant characteristics of the nuclei and the pigment within many of the tumor cells are evident. Pigment is not always as abundant as this, and as a matter of fact, about 40 per cent of the cases fail to reveal pigment within the malignant melanoblasts.

Dr. Ratzer:

Not infrequently, a subcutaneous nodule is biopsied and turns out to be metastatic malignant melanoma; but the primary tumor is not evident. Often the histologic diagnosis is cancer consistent with malignant melanoma. Why is this done—or what other cancer could this be? This is important in the search for the primary tumor.

Dr. Mulligan:

In women, one would want to consider breast cancer—this is in non-pigmented malignant melanomas when the cells maintain their polyhedral shape. However, if one looks at enough fields in one of these tumors you will find enough variablility in the cells between rounded and spindle shapes so that it looks neither like a sarcoma or a carcinoma. This should make one consider malignant melanoma.

Another feature malignant melanoma shows, especially in lymph node metastasis, is massive necrosis with fibroblastic reaction around the dead tumor cells. Sometimes they almost wipe themselves out—in effect, commit suicide.

Dr. Hill:

What is the ultimate prognosis in this patient at this time?

Dr. Ratzer:

Preoperatively we staged this man as having localized recurrent malignant melanoma without palpable regional lymph node metastasis—or Stage I melanoma which has around 70 per cent five-year survival rate.

The final histologic report in this patient revealed one regional lymph node involved with malignant melanoma which makes him a Stage II patient, but still in a large series he would have about a 50 per cent chance of surviving five years. A patient who presents with palpable regional lymph nodes at the time of initial therapy has only a 20 per cent chance of living five years. Obviously, it would have been better to have no regional node involvement, but since they were invaded it is much better the disease was microscopic.

Doctor Hill and I have reviewed the University of Colorado Medical Center experience with malignant melanoma for the past two years and would like to present it to you. The figures will have minimal significance because of the short time period covered, but still they are of some interest.

Since the summer of 1967, we have had 13 malignant melanoma patients who were operated on for cure; this means these people were either Stage I or II in a clinical classification.

There were four men and nine women. The primary site was upper extremity—two; head and neck (excluding eye)—one; trunk—three; lower extremity—six; and, unknown primary—one. Clinically there were seven Stage I patients, and six Stage II patients. All except the patient with the unknown primary tumor had wide excision of the primary tumor and skin grafting of the defect, and all of the patients had regional lymph node dissections.

After surgery histologic staging was done and three patients were found to be Stage I and ten were Stage II.

At the time of this conference we have eight patients living free of disease, three patients dead of malignant melanoma, and two patients living with malignant melanoma receiving chemotherapy. The three histologic Stage I patients are living without disease. Two of the histologic Stage II patients had local recurrences, both re-resected, and one is free of tumor and the other is living with tumor. The three patients who died of their disease had lower extremity primaries and all had large palpable inguinal nodes when first seen.

Dr. Hill:

I would like to report on the chemotherapy experience with malignant melanoma at the University of Colorado Medical Center from 1961 to 1969. The Chemotherapy Clinic, as it now exists, was started in July, 1967. Prior to that time chemotherapy was administered by residents and attending staff in the general tumor clinic.

From 1961 through June, 1967, 66 patients with malignant melanoma were treated at Colorado General Hospital. Some of these were simply referred here for end stage treatment, while others were referred for treatment of the primary tumor. The remarkable thing is that only 11 were alive at the end of 1968. Only six of the 66 patients had lived more than five years since the diagnosis of melanoma was established. Of the 55 patients who were not listed as alive, 48 were known to be dead of malignant melanoma. The other seven were lost to follow-up, and two of the seven were known to have had recurrent tumor when last seen. The vast majority of malignant melanoma patients seen at Colorado General Hospital were referred because of metastatic disease and eventually died of this disease.

Of the 48 patients who were dead of malignant melanoma, a third died within a year of discovery of the tumor, one-half within two years, and two-thirds within three years. The median survival time of the patients receiving chemotherapy is the same as those who received no chemotherapy. This is a contrast to our results in lung cancer, in which chemotherapy was definitely associated with a longer survival than surgery and/or radiation therapy in those patients who were not cured.

The patients seen in Chemotherapy Clinic after July 1, 1967, form a group with which I

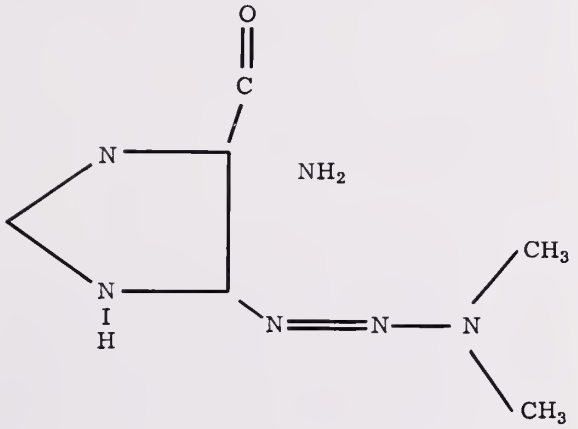
am personally familiar. Thirty-two patients with malignant melanoma were treated in the two-year period from July 1, 1967, to June 30, 1969.

From July, 1967, to September, 1968, we treated 12 patients with a total of 22 courses of therapy. There was no subjective or objective response in any patient, with the possible exception of a transient psychological benefit in a few patients. The drugs used included a wide spectrum of antimetabolites, alkylating agents and miscellaneous ones. The therapeutic courses given were Thio-Tepa (5); Alkeran (2); Hexamethylmelamine (1); Cyclophosphamide (1); 5-Fluorouracil (6); Cytosine Arabinoside (3); Azotomycin (1); Vincristine (1); Prednisone (1); and, Phenylalanine-tyrosine Restriction by Mead-Johnson Product 3200 AB (1). The median survival time was six months.

In September, 1968, Imidazole Carboxamide* became available to us for use in metastatic malignant melanoma. This agent had previously been available for our use in other tumors on a Phase II basis, and we had not observed any significant responses to it. Previous Phase I studies by other investigators had shown a substantial effect by Imidazole in malignant melanoma. However, our personal experience with many other promising agents had not been encouraging, so we were initially skeptical of the high (20 per cent) response rate reported in Phase I studies.

In the ten-month period from October, 1968, to July, 1969, we treated 20 malignant melanoma patients, using 27 courses of therapy with six different agents. A "course" of therapy is defined as a therapeutic period of six weeks or longer in which the maximum tolerable dose of an agent is administered. Imidazole Carboxamide at three separate intervals in one patient is counted as one course; however, Thio-Tepa on one occasion, followed sequentially by Imidazole and Cytoxan, would be classified as three drug courses. I ordinarily continue with a single drug until I am satisfied that either no benefit is occurring or the benefit that did occur has stopped.

During this period of time I first saw malignant melanoma patients achieve significant subjective and objective benefit from chemotherapy—actually, two patients were benefited from Imidazole Carboxamide. One patient developed a complete remission of multiple skin, lymph node, pulmonary and hepatic metastases. His therapy consisted of four standard courses of Imidazole. Another patient also developed complete remission of skin, pulmonary, small bowel and live metastases during four courses. In addition, two other patients treated with this drug demonstrated stabilization of disease which was previously progressing. These two patients received sequential courses of therapy. Even though their lesions did not improve, neither patient has shown any progression. The disease was progressing up to the point Imidazole was used, and in one patient for six months, and the other for four months there has been no progression.



The reported experience with Imidazole Carboxamide is that 20 per cent will show objective responses and another 20 per cent

*Imidazole Carboxamide is a synthetic compound with an unknown mechanism of action in cancer chemotherapy. The chemical name is: Imidazole carboxamide dimethyl triazeno, NSC 45388, known also as 5 (or 4) (dimethyltriazeno) imidazole 4 (or 5) carboxamide. The formula of the compound is: $C_6H_{10}N_6O$. The structure of Imidazole Carboxamide is:
It was originally believed that the drug would act as an antimetabolite, but recent evidence in other laboratories suggests that it may act as an alkylating agent. The high response rate in malignant melanomas was not predicted from the screening studies against tumors of lower animals. Relatively little has been published about Imidazole Carboxamide; references to it appear in Proceedings of the Amer. Assoc. for Cancer Research (Luce, J. K. Imidazole Carboxamide Triazeno (ICT) Treatment of Solid Tumors. Abstract 209, Vol. 10, p-53, 1969; and Skibba, J. L., et al. Metabolism of 4 (5) - (3,3-dimethyl-1-Triazeno) Imidazole 5 (4)-carboxamide (NSC 45388, DIC) *in vivo* and *in vitro*. Abstract 328, vol. 10, p-83, 1969) and a similar compound was studied by Tyrer, D. D. et al., Cancer Chemotherapy Reports *53*: (No. 4, Part 1) :229-241, 1969. Imidazole Carboxamide is administered intravenously to patients at a dosage of 4.5 mg/kg/day for ten days, followed by a four-week observation period. The ten-day course of therapy may be repeated, at the option of the physician.

will have subjective responses. Between October, 1968, and July, 1968, we treated 13 patients with Imidazole Carboxamide. The first four had no response, but our fifth patient stabilized and had definite subjective improvement. The next two had no response, but then we had two who derived some benefit—one had objective regression of measurable tumor, and the other had stabilization of a measurable lesion.

The next patient was a failure, but the eleventh had objective shrinkage of measurable tumor deposits. The last two patients have just started on the drug and it's too early to tell what the effect will be.

Imidazole Carboxamide is administered intravenously, and it produces side effects in most patients. Nausea and vomiting occurred in all but two patients, although usually for only two days. A mild degree of leukopenia has occurred in all but two patients. Two patients developed a fever and "flu-like" syndrove which subsided without specific medication.

In summary, we are treating nine patients with metastatic malignant melanoma at the present time (July 1, 1969). Two are receiving 5-Fluorouracil, one was on Phenylalanine Mustard until a few days ago, and six are or were on Imidazole Carboxamide. The over-all result of chemotherapy reported by the Central Drug Evaluation Program (CDEP) reveals malignant melanoma to be midway between the best, which is breast cancer, and the worst, which is esophageal cancer. The CDEP reports of therapy of malignant melanoma using all drugs show a 40 per cent survival at 26 weeks and 18 per cent at 52 weeks. While this is not good, it does have some encouraging aspects, especially when compared to results of chemotherapy of other solid tumors. Imidazole is by far the best drug to come along for malignant melanoma and should improve the over-all statistics. •

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Cancer of the stomach in Utah--*

An analysis of 637 cases

John A. Dixon, MD, Charles R. Smart, MD, and Virginia Moslander, Salt Lake City

CANCER OF THE STOMACH, although apparently significantly decreasing in incidence continues to account for a significant proportion of the visceral cancers treated by the surgeon. Under present conditions of diagnosis and therapy, the great majority of patients seen with this disease are likely to die within two years. Most reports in medical literature concerning cancer of the stomach emanate from large institutions which by their inherent nature lend an element of selectivity to the statistics reported. The following report is based upon analysis of cases of cancer of the stomach from the Utah State Tumor Registry which is a part of the Intermountain Regional Tumor Registry and Rocky Mountain States Cooperative Tumor Registry and represents the experience of a broad spectrum of institutions, large and small; and physicians, both generalists and specialists.

Clinical Material

Clinical material of this study includes 647 cases of cancer of the stomach followed by the Tumor Registry from January, 1957, to July, 1969. Since January, 1966, all known hospitalized cases have been included; whereas, prior to this time, only those cases from the nine hospital tumor registries of Cottonwood, Holy Cross, Latter-day Saints, St. Mark's, St. Benedict's, Thomas D. Dee Memorial, University of Utah, Valley, and Veterans Hospitals are included. Follow-up was accomplished on 96.5 per cent of the cases. Cases that were lost to follow-up were included as dead. The average age of patients was 64.5 years. There were 387 male and 260 female patients followed. Due to unusual ethnic characteristics of the population of regions studied, there were only two Negroes and three non-Caucasian patients in the group. Histologic confirmation of diagnosis by autopsy or surgical specimen was obtained in 574 of the patients. In 48, the attending physician felt that x-ray or clinical signs and symptoms were sufficient to confirm the diagnosis.

Stage of the Disease

Tumor staging was carried out according to the International List of disease as reported in the Cancer Prognosis Manual of the American College of Surgeons.[1] The stages were as follows:

Localized—disease limited to the mucosa, muscularis, or serosa of the stomach but not extending to surrounding organs.

Regional—disease limited to the stomach, local lymph nodes or contiguous organs.

*Presented at the Utah Chapter Meeting of the American College of Surgeons, January 31, 1970.

Distant — metastases distant from the stomach, localized lymph nodes or organs. A listing of the division of the 647 cases according to stage of the disease appears in Table 1. The percentages recorded in the International Listing appear in Column 2. The minor differences in the local experience and that reported in the International List is not statistically significant.

TABLE 1
CANCER OF STOMACH
STAGE OF DISEASE

	Utah Cases	Int. List
Localized	118 (18.2%)	16%
Regional	254 (39.1%)	36%
Distant	240 (37.0%)	39%
Unknown	35 (5.4%)	9%
Column Total	647	

TABLE 2
LAG INTERVALS BETWEEN SYMPTOMS, DIAGNOSIS AND TREATMENT IN 648 CASES OF CANCER OF THE STOMACH IN UTAH
(1957 - 1959)
LAG INTERVALS (MONTHS)

	0 - 1	1 - 3	Over 3
Symptoms to Physician	57 %	25.9%	17.1%
Physician to Diagnosis	83.1%	9.6%	7.3%
Diagnosis to Treatment	97.8%	1.9%	.3%

TABLE 3
STAGE OF DISEASE AND PATIENT AND PHYSICIAN DELAY

Stage of Disease	Patient Delay Less Than 1 Month	Physician Delay Less Than 1 Month
Localized	60 %	81.3%
Regional	50.6%	81.2%
Distant	57.7%	83.7%

Duration of Symptom to Diagnosis

The lag intervals from the time the patient had symptoms to the time he consulted his physician, from the time of consultation to diagnosis and from the time of diagnosis to treatment appear in Table 2. In 82.9 per cent of cases, consultation was sought within three months; in 91.7 per cent, a diagnosis was achieved by the physician in less than three months; in 97.8 per cent of cases, treatment was undertaken within one month of diagnosis. A comparison of stage of disease and delay in patient seeking treatment or in the physician arriving at a diagnosis appears in Table 3. It would be anticipated that the patient with localized disease would have sought help and achieved a diagnosis and undergone treatment sooner than those with distant disease. This does not, however, appear to be the case.

Geographic Distribution

There appeared to be a rather uniform distribution of cases throughout the various regions of the state with the exception of the Carbon County Hospital. This 62-bed hospital with adult admissions averaging 2,200 per year and serving a population of 11,800 reported 25 histologic proven cases of cancer of the stomach. A comparison of this instance with other counties in the state is recorded in Table 4. Carbon County area is predominantely a soft coal mining community and is on the fringes of the uranium mining area.

TABLE 4
STOMACH CANCER INCIDENCE BY COUNTY

County	Population	Cancer Cases
Iron	11,800	5
Carbon	17,000	25
Box Elder	28,800	13
Cache	42,900	17
Davis	88,700	23
Utah	130,300	37

Treatment

Surgery remains the most common form of treatment in cancer of the stomach. In the first course of treatment, radiation was used in combination with surgery in 29 cases with regional and distant disease. Chemotherapy was used in only six cases with regional and 18 cases with distant metastases in conjunction with surgery. Combinations of all three modalities were used sparingly. The summary of the types of treatment applied in the first course appear in Table 5.

TABLE 5
CANCER OF STOMACH
TREATMENT FIRST COURSE

	Surgery	Radiation	Chemotherapy	Surgery-Radiation	Surgery-Chemotherapy	Radiation-Chemotherapy
Localized	92			6	2	
Regional	175	15	6	4	4	
Distant	62	14	18	2	3	5
Unknown	7	3	1	1		
TOTALS	336	38	25	13	9	5

TABLE 6

CANCER OF STOMACH IN UTAH

Initial Stage	Status at Last Follow-Up		Years of Follow-Up									
			0	1	2	3	4	5	6	7	8	9	GT9
Localized Disease,	116 Cases												
	Alive Without Disease,	42 Cases	8	6	4	3	8	2	4	6	1	0	0
	Alive With Disease,	11 Cases	3	2	3	0	0	0	0	0	0	2	1
	Dead Without Disease,	5 Cases	4	0	1	0	0	0	0	0	0	0	0
	Dead With Disease,	54 Cases	24	15	8	1	1	2	2	1	0	0	0
	Lost	4 Cases	2	0	1	0	0	1	0	0	0	0	0
Regional Spread,	250 Cases												
	Alive Without Disease,	24 Cases	10	4	2	2	1	1	1	2	0	1	0
	Alive With Disease,	19 Cases	12	2	3	1	0	0	0	0	0	0	1
	Dead Without Disease,	7 Cases	5	1	0	0	0	0	0	0	0	0	1
	Dead With Disease,	197 Cases	137	38	15	3	3	0	1	0	0	0	0
	Lost	3 Cases	2	0	1	0	0	0	0	0	0	0	0
Distant Metastases,	236 Cases												
	Alive Without Disease,	1 Case	0	0	0	0	1	0	0	0	0	0	0
	Alive With Disease,	6 Cases	5	1	0	0	0	0	0	0	0	0	0
	Dead With Disease,	228 Cases	209	12	4	1	2	0	0	0	0	0	0
	Lost	1 Case	1	0	0	0	0	0	0	0	0	0	0
Unknown Stage,	35 Cases												
	Alive Without Disease,	3 Cases	0	1	2	0	0	0	0	0	0	0	0
	Alive With Disease,	2 Cases	2	0	0	0	0	0	0	0	0	0	0
	Dead With Disease,	30 Cases	24	3	2	0	0	0	0	0	1	0	0

TOTAL NUMBER OF CASES = 637 ***10 cases not included in survival data, diagnosed prior to 1957.

Survival

The over-all five-year survival of patients with cancer of the stomach studied was 11.3 per cent. The survival rate of patients with localized disease was 42.6 per cent. A comparison of the survival of patients with stomach cancer in the State of Utah compared with those in the Cancer Prognosis Manual appear in Fig. 1. The current status of each of the 637 cases is illustrated in Table 6.

Discussion

The apparent decline in incidence of cancer of the stomach is most interesting. The U. S. Department of Vital Statistics reports that in 1920 there were 29 deaths out of each 100,000 that were from cancer of the stomach.[2] In 1966 only 10 deaths from cancer of the stomach per 100,000 were reported.[3] Gilbertsen[4] questions the validity of the decline stating that at least a 35 per cent degree of inaccuracy in the vital statistics death report existed in the 1920 period and that the apparent decline may actually be due to greater diagnostic accuracy. That this is unlikely is suggested by the apparent lack of increase in frequency in diagnosis of cancer of other viscera in the area of the stomach which likely would have led to a mistaken diagnosis of cancer of the stomach. Inasmuch as all hospitals in the report in the region have not been reporting throughout the full period surveyed, it is not possible from the current information to state whether there has been an actual increase or decrease in the incidence of the disease in the State of Utah.

The concept that a decrease in patient delay from the time of onset of symptoms to consulting a physician, or a decrease in the time required by the physician in arriving at a diagnosis might improve the results of treatment in cancer of the stomach are somewhat questioned by the finding that in patients with symptoms of less than one month's duration, with diagnosis in less than one month, and with treatment in less than one month the incidence of localized, regional, and distant disease was approximately the same as that in patients with over three months' delay. This pattern of stage distribution was noted throughout the categories of delay of two and three months as well.

The apparent high incidence of cancer of the stomach in the population of Carbon

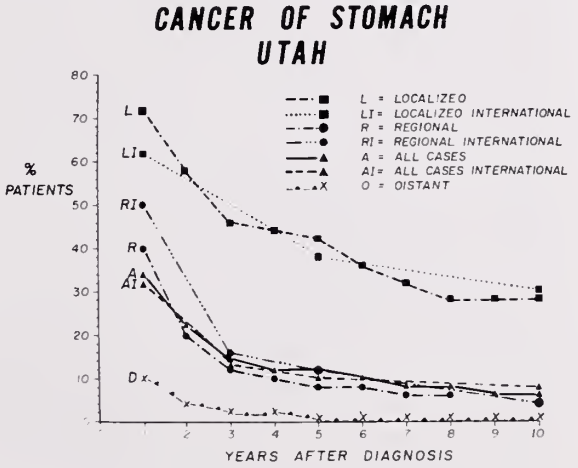

Fig. 1. A comparison of survival of Utah stomach cancer patients with those of the Cancer Prognosis Manual by stage of disease.

County is intriguing. In 1965 there were nine residents of this county of 17,000 reported with cancer of the stomach. At the same time, Utah County with a population of 130,000 was reporting 10 such patients, all with histologic diagnostic confirmation. Inasmuch as Carbon County has a rather heterogenous population, ethnic background does not seem to provide a ready answer to this incidence. A detailed study of these patients with regard to ethnic, occupational, dietary, and environmental factors is currently being undertaken and will be reported by the Registry.

The over-all survival rate of 11.1 per cent and survival rate of 42.6 per cent of patients with localized disease is very close to that reported in the Cancer Prognosis Manual. The fact that only 71 of the 637 patients are still alive and apparently without disease is sobering, as is the fact that 521 of the other patients died within one year of the time of operation or biopsy. The demonstration in Table 6 of the fact that an occasional case with localized disease or even regional spread and distant metastases may have a significant duration of useful life provides some encouragement for continued aggressive therapy in this disease.

Summary

A total of 637 cases of cancer of the stomach in Utah have been reviewed.

In comparison with the series reported by the Cancer Prognosis Manual, patients in this study were comparably distributed with respect to the incidence of localized, regional, or distant disease at the time of diagnosis.

Patient delay in seeking medical advice or physician delay in arriving at a diagnosis or applying appropriate treatment did not correlate well with the relative incidence of localized, regional or distant disease.

There is an apparent geographically determined higher incidence of cancer of the stomach in Carbon County which will require further evaluation.

The over-all five-year survival rate is 11.1 per cent, and it is evident that an occasional case will have an unexpectedly long period of survival following apparently far-advanced disease. •

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Perforated diverticulitis of the colon*

Surgical Management

Leon Sherman, MD, Arvada, Colo.

MANAGEMENT OF DIVERTICULITIS of the colon has been of concern to both internists and surgeons because of the long morbidity involved. The 3-stage operation considered safest in cases of obstruction or peritonitis involves a long waiting period between establishment of the colostomy and resection of the diseased bowel. The prolonged illness represents a severe economic drain on the patient and his family and we are challenged to find a more rapid way to return these patients to a normal life.

The literature in the 1930's mentions the possibility of closing the colostomy without resection after the diseased bowel has returned to normal. This was suggested by W. J. Mayo in 1930, Abell in 1934, and Judd and Phillips the same year. Pemberton, in 1947, reported on a large series of cases, 31 of which were treated in this manner. Berman, in a scholarly review of the subject, shows the disease is always outside the colon—peridiverticulitis—resulting from a leak of the diverticulum.

Two recent cases are reported below, both of perforation of a diverticulum, one with an abscess of the rectosigmoid with small bowel obstruction, the other a free perforation of the sigmoid colon with generalized peritonitis. In both cases, the patient was explored, drained, and a diverting colostomy performed. A few weeks later the colostomies were closed without resection of the bowel, it having been ascertained that the bowel had returned to a normal state.

*From the Department of Surgery, Beth Israel Hospital, Denver. Reprint requests to Dr. Leon Sherman, 8850 Ralston Road, Arvada, Colorado.

CASE REPORTS

Case 1: A 64-year-old male was admitted Apr. 19, 1969, with nausea, vomiting distention, bloating and cramping of three days' duration. Systemic history was otherwise negative except for nocturia, times 5, and dribbling. Physical examination showed a well-nourished, well-developed male, with temperature 96.6, pulse 60, respirations 22, blood pressure 160/80. Hemoglobin was 14 gm. and hematocrit 43 per cent. WBC was 12,400, with 27 Stabs, 62 Segs, 11 Lymphs. Urinalysis showed 2+ albumin. ECG showed some right axis deviation. Electrolytes were within normal limits except for a BUN of 63, uric acid 9.4, total bilirubin 1.4, alkaline phosphatase 120, and LDH 220. X-ray of chest was reported negative. X-ray of abdomen, 3 views, showed several loops of distended small bowel interpreted as obstruction at the jejuno-ileal junction. At barium enema the colon filled well with reflux into the terminal ileum demonstrating multiple diverticuli in the sigmoid region; no associated inflammatory changes were identified.

Miller-Abbott suction and a catheter drainage of the bladder were instituted. Emesis and distention continued. On the third hospital day, patient was explored. Many loops of distended small bowel were found and one loop was adherent to the rectosigmoid and bladder. As these structures were separated a chicken bone was found extruding from a diverticulum in the rectosigmoid. The foreign body was removed and the opening closed loosely with surrounding fat tags. The small bowel was decompressed by admitting a suction tube and reefing the bowel on the tube, tying the previously placed pursestring suture after the decompression. The pelvic cavity was drained and upon closing the abdomen, a transverse colostomy was made. Postoperatively, the patient showed signs of septic shock, but this was controlled by appropriate antibiotics. Thirty days following the surgery, the patient was discharged with the colostomy. There was still some drainage from the wound and an indurated mass could be felt high through the rectum.

Fig. 1 Case 1. Seven weeks after exploratory operation.

Two weeks later, patient was returned to the hospital. He had gained 8 pounds. The abdominal wound was healed. Rectal examination showed no evidence of the indurated mass previously felt. A barium enema showed free passage of barium to the colostomy site. Several diverticuli were seen in the sigmoid colon, but no inflammatory changes were observed. Two days later, (seven weeks after the original exploration) the colostomy was closed. The patient made an uneventful recovery. Seven months following initial surgery, patient had gained additional weight, and a barium enema 21 days following closure of the colostomy was normal. The patient is enjoying an active life.

Case 2: A male, aged 54, weighing 250 pounds, was admitted June 28, 1969. Chief complaint was abdominal pain, generalized. One week before admission, patient had severe pain between his shoulders. The morning of admission, there was sharp upper abdominal pain which soon involved all of the abdomen, especially the right lower quadrant. There was no history of previous abdominal pain, distention or obstruction and no history of ulcer. Temperature was 101.4, pulse 112, respirations 28, blood pressure 122/88. Examination showed large obese male with abdominal distention, pain and dyspnea. Chest was clear, and heart was normal. Abdomen was distended, and tympanitic, with guarding and rebound tenderness of lower abdomen. Mild right CVA tenderness was noted. Peritoneal tap of RLQ revealed pure pus. Hemoglobin was 17.6 gm. WBC was 7,450 with 25 Stabs, 53 Segs, 22 Lymphs. UA was negative.

Patient was hydrated and then explored through a right paramedian incision. The appendix was infected but not diseased. An abscess was found on the left side in region of sigmoid, and this was aspirated and drained. Abdomen was closed and a transverse colostomy done. Patient did well and was discharged 3½ weeks postoperatively. There was still drainage from the abdominal wound. Weight was 222 pounds.

He returned 3 weeks later. A superficial wound from previous surgery cultured E.Coli. Barium enema showed free flow of the barium through the sigmoid, descending and distal ½ of the transverse colon, without evidence of abscess formation or fistula or perforation. The patient complained only of a fullness and tightness in RLQ. A laparotomy was done through a left paramedian incision. A number of adhesions of small bowel to right abdominal wall were taken down. A segment of omentum containing a sterile abscess was removed. The sigmoid colon was free of induration and no inflammatory reaction was present, confirming the radiologist's report. The abdomen was closed without resecting the colon and the colostomy was also closed. The patient was discharged 10 days postoperative with normal bowel movements and free of pain. Four months following the first operation, patient was well and active. A barium enema at that time revealed a normal colon.

Discussion

If certain selected cases of perforated diverticulitis could be managed without resection, this should merit serious consideration as a means of reducing the long-term morbidity of this disease. While resection of the involved bowel has a natural appeal to the surgeon, it is not without danger. Colcock indicated disease at the suture line, fistula formations, abscess and sepsis are some of the complications to be expected. Pemberton analysed his 31 cases handled without resection, and of these, nine were well on

Fig. 2 Case 2. Seven weeks after exploratory operation.

various periods of follow-up; the others were known to have recurrent symptoms. Today's antibodies were not available in this series. It is not stated specifically what his criteria were for closure of the colostomy and it is not known if the recurrence represents the original lesion or another one.

If the following criteria are satisfied, I believe that closure of the colostomy is indicated, without a need for resection of the colon:

1. Complete healing of all abdominal wounds and/or fistulae.

2. Absence of pain, tenderness or obstructive symptoms and fever.

3. Barium enema of distal colon showing good distensibility, no obstruction, fistula, abscess, or tumor.

If the above conditions can be met, there should be no reason to delay closure of the colostomy, and no preconceived time limit should be necessary. If symptoms occur at a later date, they should be treated on an individual basis. Some may require medical management, others might require a resection. However, the approach described will rehabilitate a number of patients much faster. There will always be the group that require resection, and three months from time of colostomy would seem to be a reasonable waiting period for this group.

Summary

Two cases are presented of perforated diverticulitis, one with an abscess and obstruction, the other with generalized peritonitis. Both were explored and diverting colostomy performed. In both cases, the colostomy was closed without resecting the involved bowel because the latter had healed. Criteria are listed for the decision to close the colostomy. It is felt the long morbidity usually associated with diverticulitis with perforation can be appreciably reduced in certain cases. •

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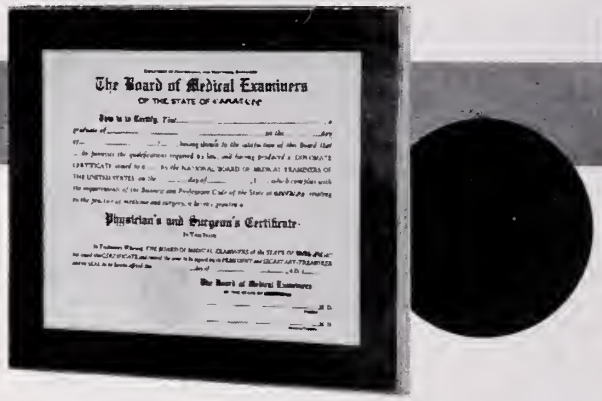

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NEW MEXICO

Abstract of Minutes, House of Delegates of The New Mexico Medical Society

TWELFTH INTERIM MEETING
FARMINGTON, NEW MEXICO
November 7-8, 1969

The House of Delegates held two meetings at the Twelfth Interim Meeting in Farmington, New Mexico, November 7 and 8, 1969. The Speaker, **Ronald V. Dorn, M.D.,** and Vice Speaker, **William J. Hossley, M.D.,** alternated to presiding before the House. At the first meeting all the reports published in the Handbook and all supplemental reports and resolutions which had been mimeographed after publication of the Handbook, as well as verbal and typed resolutions introduced on the floor of the House, were referred to appropriate reference committees.

FIRST SESSION

Friday, November 7, 1969

The House was called to order at 2:00 p.m. **James R. Gay, M.D.** pronounced the invocation. Forty-four delegates answered the roll call, including certified substitutes and alternates.

The minutes of the 83rd Annual Session of the House of Delegates of the New Mexico Medical Society, May 7-9, 1969, were approved as published in the September issue of the *Rocky Mountain Medical Journal.*

The Speaker introduced **Hugh B. Woodward, M.D.,** President, New Mexico Medical Society, for his presidential address. Dr. Woodward welcomed the distinguished guests to this House of Delegates as follows: Members of the New Mexico Chapter of the Student American Medical Association, Allan L. Haynes, Jr., and Richard Otoski; Williard Kottke, D.D.S.; President, New Mexico Dental Association; Mr. G. L. Butler, President, New Mexico Hospital Board of Trustees; Mr. John Petty, Reporter, *Albuquerque Journal;* Mr. Duane Packard, Executive Director, Medicare for Equitable; Mr. LaVon Burrell, President, New Mexico Blue Cross-Blue Shield; Mr. Dave Morrison, Field Representative, American Medical Association; Donald C. Harrington, M.D., President, San Joaquin Foundation for Medical Care, Stockton, California. Dr. Woodward introduced to the House of Delegates the New Assistant Executive Secretary to the New Mexico Medical Society, **Mr. Tom Bodnar.**

(Condensed abstract from the stenographic minutes kept by Mrs. Ralph R. Marshall Reports referred to but not reproduced herein were distributed to all members of the House in mimeographed form. Copies of all reports are on file in the Executive Office of the Society and in the office of the Secretary of each component society, available for study by any members, and together with this abstract, present in full all proposals as well as actions taken on them.)

Dr. Woodward stated that he would not take the valuable time of the House of Delegatees to discuss committee reports inasmuch as his own ideas had already been presented in various issues of the *NEWSLETTER.* However, he urged the House of Delegates to consider the issues before the House and to actively participate in the reference committee hearings.

Ronald V. Dorn, M.D., Speaker of the House of Delegates, introduced **Donald C. Harrington, M.D.,** President, San Joaquin Foundation for Medical Care of Stockton, California. Dr. Harrington presented a detailed report using slide presentations of the operation of the San Joaquin Foundation for Medical Care. He stated that the major objectives of the Foundation were:

1. Stimulation or comprehensive prepaid care programs.
2. Certainty of coverage.
3. Utilization of total community resources.
4. Peer review and quality control.
5. Changing patterns in the delivery of health care.

Speaker Dorn appointed the following to membership on reference committees:

A. Administrative Matters
J. C. Dotson, M.D., Los Alamos, Chairman
George J. Atkinson, M.D., Albuquerque
Ronald K. Cooper, M.D., Albuquerque
Robert C. Coleman, M.D., Portales
R. C. Derbyshire, M.D., Santa Fe

B. Legislation and Public Affairs
J. Hunt Burress, M.D., Albuquerque, Chairman
Merril W. Brown, M.D., Albuquerque
Matt A. Connell, M.D., Grants
F. M. Middlebrook, M.D., Hobbs
Levi B. McCarty, M.D., Aztec

C. Miscellaneous Business
Irving Klein, M.D., Albuquerque, Chairman
T. L. Stangebye, M.D., Roswell
Byron Beddo, M.D., Albuquerque
Julius L. Wilson, M.D., Santa Fe
John S. Moore, M.D., Roswell

Several matters had been mimeographed and placed before the delegates which were not contained in the Delegates Handbook and the Speaker referred these to the reference committees prior to recessing the first session of the House of Delegates at 3:45 p.m.

SECOND SESSION

Saturday, November 8, 1969

The House was called to order at 2:00 p.m. with forty-four delegates answering the roll call, including an accredited alternate delegate.

Speaker Dorn appointed the following tellers: Byron Beddo, M.D.; T. L. Stangebye, M.D., and John B. Roberts, M.D.

Report of Reference Committee on Administrative Matters

The following reports considered by the Reference Committee on Administrative Matters were for *information only,* included no recommendations, required no policy action, and *were filed:*

Report of the Delegate to the American Medical Association
Report of the Advisory Committee to Selective Service
Report of the Grievance Committee
Report of the Insurance Committee

The published meeting of the *Council* held on August 9, 1969, was considered and the following item No. 9 of this report was recommended to be disapproved by the reference committee:

"9. Approved: That the New Mexico Medical Society participate with other Rocky Mountain States in a reception-cocktail party honoring Irvin E. Hendryson, M.D., at the AMA Clinical Session in Denver, November 30-December 4, 1969. Unanimous."

A vote was taken by the House and the reference committee's recommendation that this action of the Council be disapproved was defeated. Therefore, the Council's action of August 9 was approved by the delegates. The remainder of the Council meeting of August 9 was approved with the exception of item number 5 which is superseded by item number 3 of the supplemental Council minutes which will be considered later.

The Mental Health and Alcoholism Committee recommended to the delegates that the delegates support Senate Bill 2523, which is an extension of the existing legislation covering the support of comprehensive mental health centers in various communities in New Mexico. The Reference Committee was of the opinion that they did not have sufficient information on this Bill and, therefore, recommended postponement indefinitely on a decision regarding this matter. After discussion on the floor of the House of Delegates, a motion was made for approval of the *Mental Health and Alcoholism Committee Report* with the recommendation to approve

A resolution from the *New Mexico Society of Ophthalmology* requesting that the New Mexico Medical Society designate as an ex officio member of its Legislative and Public Policy Committee the president of the New Mexico Society of Ophthalmology, and that the Council of the New Mexico Medical Society and its executive officers be urged to call upon the officers of the New Mexico Society of Ophthalmology for consultation and advice on any problems involving ophthalmologic medical practice, public information, and inquiries of state or federal regulatory agencies was considered. The Reference Committee recommended that the request for an ex officio member be deleted but that the second request for the State Society to call upon the officers of the New Mexico Society of Ophthalmology for a consultation was approved by the House of Delegates.

A resolution from *Santa Fe Medical Society* requesting the New Mexico Medical Society to contribute no money toward a reception-cocktail party at the AMA Clinical Session in Denver from November 30-December 4, 1969, was defeated. A motion was passed by the House of Delegates providing the Council with the decision as to contributions for promoting a candidacy to an AMA office to the best of their ability and wisdom.

The *Supplemental Report of the Council* was considered and the committee recommended that this report be approved with the following exception:

3A. Paragraph 2, to be amended by adding a period after "committee" and deleting the following phrase: "in going against the instructions of the Council." Therefore, the amended sentence would read: "Approved: That the Council approve the foresight and courage of the Fee Survey Committee." The motion to amend was *carried*. Item 5C. as follows, was recommended disapproved and *carried:* "That the President's special travel fund and per diem be used for in-state as well as out-of-state travel at the President's discretion, to reimburse the President Elect, designee of the President in visiting County Medical Societies."

The following *substitute* motion for item 5C. above was approved as follows: 'That the President's special travel fund and his per diem may be used for in-state, as well as out-of-state, at the President's discretion, to reimburse the President Elect or Vice President, as designee of the President, in duties normally performed by the President. It is strongly urged that the privilege of designation be exercised only in situations of illness or emergency, and not be adopted as policy."

A *resolution* from the *Council* was as follows: "We oppose payment for chiropractic treatment under any government-sponsored medical care program, because in dealing with any unscientific method of treatment it is impossible to apply any form of quality control." This was approved by the Council with instructions that copies of the resolution be forwarded to the New Mexico Congressional Delegation.

Report of Reference Committee on Legislation and Public Affairs

The following reports considered by the Committee on Legislation and Public Affairs were for *information only,* include no recommendations and require no policy action and *were filed:*

Legislative and Public Policy Committee
Liaison Committee to the Department of Health and Social Services
Mission and Planning Committee
New Mexico Physicians' Service
Board of Trustees Report
Fee Committee Report

The following resolution was submitted by the **Mission and Planning Committee** and was approved following amendments to read as follows:

WHEREAS, experience of Foundation-type programs has demonstrated that there is more efficient operation at less cost and increased quality care to the public by being administered by medical society foundation programs; and,

WHEREAS, the Medicaid program is in a total state of confusion with much dissatisfaction among the providers and the patients, and

WHEREAS, commercial insurance carriers of group insurance programs have indicated a willingness to cooperate with a foundation program sponsored by the New Mexico Medical Society; and

WHEREAS, the director of New Mexico Health and Social Services Department has expressed a keen interest in studying the feasibility of contracting with a foundation program sponsored by the New Mexico Medical Society to administer Medicaid in New Mexico;

THEREFORE, BE IT RESOLVED that the House of Delegates instruct the Council of the New Mexico Medical Society to encourage New Mexico Physicians' Service to immediately assume the status of a foundation program and to concern itself with negotiating contracts, including fees, standards and utilization review, for members of the New Mexico Medical Society subject to the final aproval of the Council.

Public Relations Committee had recommended to the House of Delegates the discontinuance of the Science Fair scholarships that have been sponsored by the New Mexico Medical Society for the past eleven years. However, the Reference Committe recommended that the scholarships be continued rather than abandoned and further that the Guy Rader journalistic awards be continued and that the Society should make a concerted effort to inform the news media of this award. The recommendations of the Reference Committee were approved by the Delegates.

The House of Delegates reaffirmed its previous direction that the **Fee Committee** should renegotiate with all third parties on the basis of usual, customary and reasonable fees only.

The **Reference Committee** recommended to the officers of all component County Medical Societies that they encourage each of their members who have received a questionnaire concerning usual fees to complete and return the questionnaire at the earliest possible time. The House of Delegates expressed its gratitude to the various organizations and individuals who contributed generously of time, work, and money to the State Society to begin this resurvey of fees.

A *resolution* from the *Eddy County Medical Society* calling for a separation of the New Mexico Department of Welfare and Health and that the Public Health Department be placed under the direction of a Doctor of Medicine was considered and a recommendation for indefinite postponement was carried by the House of Delegates.

A Santa Fe County Medical Society resolution calling for a State Society protest to the Director of the Department of Health and Social Services was disapproved by the House of Delegates.

A Santa Fe County Medical Society resolution requesting a special committee for professional evaluation of public health activities be created was officially referred to the Liaison Committee to the Department of Health and Social Services.

The Professional Utilization Committee made the following recommendations which were approved by the House of Delegates with the instructions that the committee carry out these recommendations:

1. Peer review of all cases to avoid the charge that too few claims are being submitted to this type of review, and also the claim that utilization review is being conducted by clerks should be established at an early date.
2. The mechanism to discipline repeat offenders should be clearly enunciated.
3. Peer review combining the functions of the Utilization Review Committee, Adjudication Committee, some of the functions of the Fee Committee and Grievance Committee may be established. Specially, the members of the committee feel that a foundation-type program would afford this type of review which would expedite the activities of all committees and save time and energy for many members of our Society.

Report of Reference Committee and Miscellaneous Business

The following reports considered by the committee on administrative matters were for *information only*, included no recommendations and required no policy action and *were filed:*

Comprehensive Health Planning Committee, Dyslexia Committee, Emergency Medical Care and Accident Prevention Committee, Medical-Legal Committee, Liaison Committee to Allied Professions and Voluntary Health Agencies, Rocky Mountain Medical Conference Continuing Committee, Liaison Committee to UNM School of Medicine, Report of Rocky Mountain Medical Journal, General Convention Committee, the recommendations of the Maternal and Perinatal Mortality Committee were considered as follows:

1. That we adopt a system of policy within the State, and preferably one supported by State law and the State Health Department, which would require that all women who expire within six months of the termination or completion of their pregnancy be reported to this committee for review so as to determine relationship of their pregnancy to their demise. This recommendation was approved by the House of Delegates.

2. We recommend that a system of review and reporting be adopted as is in practice in Franklin County, Ohio, under the direction of Anthony Ruppersberg, M.D. The second recommendation was tabled until the May Annual Meeting.

BYLAWS, Chapter 7, Section 2B, was amended and the amended section as approved by the House of Delegates is as follows:

The members of the *Nominating Committee* shall be elected by the House of Delegates at the Annual Meeting of the House. The Nominating Committee shall consist of one member from each Council district. The two immediate past presidents will also serve as members of the Nominating Committee. The Nominating Committee shall receive the name of a nominee from each component society by February of each year. The Council districts, comprising one County Society, shall submit two or more nominees to be considered by the House of Delegates. All nominees shall be members in good standing. In the event the local Council district does not provide the Nominating Committee with a list of nominees by the date specified, nominees from that area shall be chosen by the Nominating Committee itself. The annual election ballot shall contain the names of each County Society's nominee(s) from each district, one of whom shall be elected by the House of Delegates to represnt his Council district on the Nominating Committee. After the members of the Nominating Commitee have been elected by the House of Delegates, the President of the Society shall appoint one of the members who has been elected to the Committee to serve as chairman of the committee. The members of the Nominating Committee shall serve a term of two years staggered terms.

The following *Taos County Medical Society resolution* was approved as amended:

BE IT RESOLVED, that the Taos County Medical Society request that the State Medical Society to investigate the feasibility of establishing preceptorship-type of training in our medical school.

An information report from the *Rocky Mountain Medical Journal* indicated that they were anticipating an increase in subscription dues to the *Journal* from $2.50 to $3.50 beginning in 1971. The House of Delegates expressed the concern that this represented an additional request for funds from our general fund and that this subject be referred to our Budget Committee for evaluation and report to the May, 1970 Annual Meeting.

The report of the **Liaison Committee** to Allied Professions and Voluntary Health Agencies indicated that the Committee does not favor a joint statement with the New Mexico Nurses' Association on the role of the registered nurse in acute cardiac care. The committee pointed out that the legal counsel for the New Mexico Medical Society recommended against a joint statement. The New Mexico Medical Society should offer its cooperation with the New Mexico Heart Association, New Mexico Nurses Association, and New Mexico Hospital Association to help in arranging educational programs and in establishing criteria for standards of cardiac-care nursing. The House of Delegates concurred with the committee's recommendations.

Julius L. Wilson, M.D., was recognized and introduced the following resolution which was approved by an enthusiastic and hearty applause:

I move that the House of Delegates thank the San Juan County Medical Society, the Auxiliary to the San Juan County Medical Society for all the hospitalities extended to the Delegates at this meeting; and express appreciation to Governor Tom Bolack for the excellent cocktail party at the B-Square Ranch and his interesting talk at the banquet.

Speaker Dorn announced that the following were elected as *nominees* to the *Blue Shield Board* for the Board's consideration in selecting five individuals to fill the five vacancies that will occur at their annual meeting:

Joel Barkoff, M.D., Albuquerque
Eric Best, M.D., Albuquerque
J. Hunt Burress, M.D., Albuquerque
Morton Dann, M.D., Roswell
James R. Gay, M.D., Albuquerque
Leslie Hamm, M.D., Silver City
Fred Hanold, M.D., Albuquerque
Richard Streeper, M.D., Santa Fe
Bob Williams, M.D., Las Cruces
Ronald V. Dorn, Jr., M.D., Albuquerque

The President of the New Mexico Medical Society, **Hugh B. Woodward, M.D.,** moved that:

An expression of appreciation on the part of the House of Delegates to the Speaker, Vice Speaker, and our staff. I would like to make the House aware that the Speaker came a day early, and came to Farmington several months ago to make arrangements for this meeting. I think that he has done a tremendous job here. An applause of appreciation and approval was expressed by the House of Delegates.

Joseph Sharpe, M.D., Councilor from Farmington was accorded the floor. Doctor Sharpe expressed his concern with regard to the resolution establishing the Foundation program in New Mexico, in that a lot of doctors in the State are not informed as to what we are undertaking and it was his feeling that before this Foundation is established the doctors of the State should be made aware of what we are getting into and *moved* that the House reconsider this motion with the idea of disseminating more information before it does come up for a vote. The motion was seconded by J. C. Dotson, M.D., and after debate, the motion was defeated.

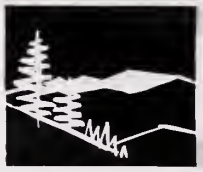
There being no further business before the Twelfth Interim Meting of the House of Delegates of the New Mexico Medical Society, the Speaker declared the House adjourned at 4:20 p.m.

MONTANA

Physicians in the News

Robert K. West, MD, formerly of Cut Bank, is now serving a tour of duty with Project Hope in Ganado, Arizona. This program of Project Hope will introduce Navajo and other Indian groups to career opportunities in medical and health fields. In addition, the program will develop and implement training for the Indians in nursing, laboratory and x-ray techniques, community health, and other related medical fields.

Walter H. Hagen, MD, Billings, recently received the distinguished service award from Eastern Montana College. Doctor Hagen was presented this award because of his numerous activities in college functions. He served as medical director of the Montana Center for Handicapped Children for 21 years and also supported and helped develop the programs at the center.



COLORADO

New Officers for the Rocky Mountain Allergy Society

New officers of the Rocky Mountain Allergy Society, an organization of physicians and other workers in the field of allergy, are Franklyn Newmark, MD, president; John Selner, MD, vice president; and Henry Claman, MD, secretary-treasurer.

Doctor Newmark practices allergy in Lakewood and is Assistant Clinical Professor of Medicine at the University of Colorado School of Medicine. Doctor Selner is a pediatric allergist in Denver and also serves on the medical school faculty. Doctor Claman is Assistant Dean at the medical school. The new officers will serve for two years.

Eighteen from Colorado and Wyoming Elected to Advisory Group

Eighteen Colorado and Wyoming health care professionals and government and civic leaders were elected to serve three-year terms on the Regional Advisory Group of the Colorado-Wyoming Regional Medical Program (RMP) during the group's winter meeting Friday (Feb. 27) in Denver. Prior to the election, the advisory group voted to increase the size of the membership from 29 to 40 in order to provide a broader representation from throughout the two states.

Comprised of medical professionals and laymen from throughout the two states, the advisory group serves as a "board of directors" for the federally funded RMP to provide local guidance to the program and assist in solving regional health care problems. Members of the advisory group serve voluntarily without compensation.

The RMP, one of 55 similar programs across the nation, is designed to improve the quality and availability of health care in Colorado and Wyoming, particularly in the area of heart disease, cancer, stroke and related diseases. RMP objectives are being met with a growing system of educational and health care activities in the two states.

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MEDICAL SCHOOL NOTES

University of Colorado Medical Center

The Deafness Research Foundation of New York City announced a grant of $13,530 in third-year support of the research of William G. Hemenway, MD, professor and head of the Division of Otolaryngology in the University of Colorado School of Medicine, into the pathological changes underlying congenital deafness. The $13,530 will assist Doctor Hemenway's research during the 1970 calendar year. The foundation presented its check for $6,765 to cover support during the first half of the year. Doctor Hemenway has been recipient of research support from DRF for this and other investigations since 1965. The new grant is part of more than $250,000 allocated by the foundation to otological researchers at 25 institutions.

Doctor Hemenway is a supervisor at the CU Medical Center for one of 37 temporal bank laboratories linked in a national network under the guidance of the DRF, the American Academy of Ophthalmology and Otolaryngology, and the Armed Forces Institute of Pathology. Doctor Hemenway and the other 36 laboratories in the network report their findings periodically to four regional temporal bone bank centers at Johns Hopkins Hospital in Baltimore, the University of Chicago, Baylor University in Houston, and the University of California School of Medicine in San Francisco.

* * * * *

Joseph A. Preston, MD, director of laboratories at Denver General Hospital and head of the Colorado Pathologists Reference Laboratory, has been promoted to clinical professor of pathology on the volunteer faculty of the University of Colorado School of Medicine. Doctor Preston has been a member of the CU medical faculty since 1967, when he was appointed assistant clinical professor of pathology.

Before coming to Denver in 1967, Doctor Preston was assistant chief of the Department of Experimental Pathology at the Walter Reed Army Institute of Research, Washington, D. C., from 1954 to 1957, and director of laboratories at Mercy Hospital, Jackson, Mich., 1957-67. He is a diplomate of the American Board of Pathology in pathologic anatomy, clinical pathology and clinical chemistry, and a fellow of the College of American Pathologists, American Society of Clinical Pathologists and American College of Physicians. He is also a member of the American Assn. of Clinical Chemists, the American Medical Assn., and the Nuclear Medicine Society.

University of New Mexico School of Medicine

Lots of New Mexico young people dream of a medical career, but think their chances of ever becoming a doctor, nurse or laboratory worker are pretty slim. Now, because of a new division at University of New Mexico School of Medicine, that dream may become a reality. The medical school has opened an Office of Special Education—especially designed to help produce more doctors and paramedical personnel for rural communities in the state. Alonzo C. Atencio, MD, is the new assistant dean for special education.

Doctor Atencio is the son of a Brazos country cowboy who worked his way through college as a waiter—and is especially interested in trying to find students from low income, rural areas who want a medical education, and who, if they can stay out of debt while getting their education, would be most likely to return and practice in their home towns.

The faculty of the medical school is contributing some funds for the scholarship program and Doctor Atencio hopes to get additional foundations support. Jobs in the medical schools will be available for some of the students. Also, The National Education Association of New Mexico has provided a $500 scholarship in memory of Charles H. Wood, executive secretary of the Association from 1959 until his death in 1965.

Doctor Atencio said he knew from personal experience that there are a lot of bright, talented youngsters from economically and culturally deprived backgrounds who don't make it, because they lack the money, the encouragement or the stamina. The school wants to find these people, and if they are motivated toward the health professions, give them a boost.

Doctor Atencio has sent letters to every high school principal in the state, seeking suggestions of names of youngsters who might fit these qualifications. The letters point out that in 1965 New Mexico ranged 43rd down the list of states in the number of civilian physicians, 47th in civilian dentists, and 41st in professional nurses. In 26 of the 29 counties surveyed, the population-physician ratio was greater than 1,500 to one (in one county 8,243 to one), compared to a national average of 680 to one.

A summer "enrichment program" already is planned for interested college students who have not prepared for a career in medicine but have chosen other fields. The summer lectures in the biological sciences will teach students "the language" necessary to understand the biological concepts taught in medical school.

Doctor Atencio recently joined the UNM medical staff from Northwestern University, where he held National Institute of Health post-doctoral fellowships and was a faculty member in biochemistry. He holds a B.A. in chemistry, an M.S. in biochemistry and a Ph.D. in medicine, all from the University of Colorado at Denver.

A UNM pharmacy graduate and now a first-year medical student, Franklin D. Perry, has received a four-year scholarship at University of New Mexico School of Medicine. Perry was chosen as one of 12 outstanding black college students in the nation to receive the awards, averaging $8,000 each. These students are the recipients of the National Medical-Sloan Scholarships, the highest awards made by the National Medical Fellowships, Inc. to entering medical students.

Mr. Perry holds a B.S. in pharmacy from UNM. He was a member of the International Club and Rho Chi pharmacy honorary during his undergraduate days.

* * * * *

A unique grant from the Public Health Service, Heart-Lung Institute, has been awarded to the University of New Mexico School of Medicine for training a variety of specialists interested in kidney physiology. The grant, totaling a quarter of a million dollars, has been made to Sidney Solomon, MD, chairman of the medical school's Department of Physiology. First-year funds are $52,282, with five years of financial support recommended if funds are available. The grant will train persons who are interested in the kidney in multiple disciplines: surgery, obstetrics-gynecology, physiology, pharmacy and medicine. Trainees will be at three levels: summer students, which will include medical students interested in kidney study; pre-doctoral students in basic sciences and post-doctoral students who already have their Ph.D. degrees.

* * * * *

The strong program in cancer research at University of New Mexico School of Medicine has received another boost, with a $23,570 grant from the American Cancer Society. A total of $132,570 has now been given by the Cancer Society to the medical school for special research by Robert Loftfield, MD, chairman of the Department of Biochemistry. Doctor Loftfield is working on the theory that cancer results when the body cannot correct normal "mistakes" which occur during interaction between amino acids, RNA and enzymes. Last March, Doctor Loftfield received an American Cancer Society grant for $90,160 to study these interactions. Last December, the Society awarded $17,500 to Michael Stone, MD, to also do research into the frequency of error in protein synthesis.

Currently, scientists do not know what causes a cell to become cancerous. There is a strong possibility, the doctors believe, that it is a consequence of the cell's ability to make errors or to cope with errors when they have been made. Doctor Stone's research deals with how frequently these errors occur, how they are handled in the body and what mechanism in the body detects the errors and gets rid of them.

OBITUARIES

Montana

Harold Morrison Teel, MD, Polson, died on January 29, 1970. Doctor Teel was born in North Robinson, Ohio, on November 23, 1901.

Doctor Teel attended the University of Washington and the University of California and was graduated, magna cum laude, in 1929 from Harvard Medical School. He engaged in the practice of surgery in Cleveland, Ohio, for two years and then accepted a Rockefeller Foundation scholarship to study the problem of maternal mortality in Europe for a period of two years. He then undertook an association with the School of Public Health at Harvard and instituted its first school of maternal health. Doctor Teel taught and practiced medicine at Harvard until he moved to Polson in 1940. He served as a member of the medical corps of the United States Army from 1942 until his discharge in 1945. Shortly thereafter, Doctor Teel accepted an appointment as professor and chairman of the department of gynecology and obstetrics at the American University Medical School in Beirut, Lebanon. Two years later he returned to Polson where he engaged in the general practice of medicine and obstetrics until his retirement in 1964.

Doctor Teel, in addition to his dedication to medical practice, was interested in the cattle and ranch business. He raised registered polled Herefords and experimented with various crop programs at his ranch on the south shore of Flathead Lake.

Utah

George A. Cochran, MD, Salt Lake City physician and surgeon for more than 50 years, died February 27, 1970, at the age of 84.

Born July 24, 1885, in Tooele, Utah, he was the son of George M. and Pamela Whitehouse Cochran. He married Mary Cook in the Salt Lake L.D.S. Temple on November 1, 1911. Doctor Cochran received a B.A. degree from the University of Utah, and then taught mathematics at Ricks College in Rexburg, Idaho. He later attended medical school at the University of Chicago, and also studied at the University of Pennsylvania. He served his internship at the Presbyterian Hospital in Chicago. Upon returning to Utah, he was instrumental in founding the American Fork Training School, and also a children's hospital at Ft. Douglas.

Doctor Cochran was a charter and Master Key member of the Salt Lake City Lions Club, and from 1933 to 1934 served as club president. He was also a charter member of the Ft. Douglas Country Club.

Doctor Cochran served as a Major in the U. S. Army Reserve Medical Corps from 1924 to 1941. He was a member of the Salt Lake County Medical Society, the Utah State Medical Association, and the American Medical Association.

He is survived by his wife; two sons and a daughter, Acton, Long Beach, Calif.; Col. (Ret.) James Maxwell, Mountain View, Calif.; Mrs. Dorothy Darlow, Sacramento, Calif.; seven grandchildren; one great granddaughter; two brothers and two sisters.

THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

American Men of Science: Social and Behavioral Section: Edited by Jaques Cattell Press. 11th ed. New York, 1968, Bowker Company. 2 vols. Price: $55.00.
Current Therapy: By Howard F. Conn. Philadelphia, 1970, Saunders. 867 p. Price: $15.50.
Diagnostic Roentgenology, v. 5, 1969: By Ross Golden. Baltimore, 1969, Williams & Wilkins. 942 p. Price: $41.50.
Drugs of Choice: By Walter Modell. St. Louis, 1970, Mosby. 924 p. Price: $20.50.
Modern Drug Encyclopedia and Therapeutic Index: Edited by Arthur Lewis. New York, 1970, Yorke Medical Group. 788 p. Price: $22.50.
Principle of Parsimony and Other Essays: By I. M. Tarlov. Springfield, Ill., 1969, Thomas. 65 p. Price: Review.
Progress in Neurology and Psychiatry, v. 24, 1969: Edited by E. A. Spiegel. New York, 1969, Grune & Stratton, 541 p. Price: $24.75.
Psychiatry and The Criminal: By John MacDonald. Springfield, Ill., 1969, Thomas. 352 p. Price: Gift.
Team Practice and The Specialist: By John J. Horwitz. Springfield, Ill., 1970, Thomas. 164 p. Price: Review.
Textbook of Nuclear Medicine Technology: By Paul J. Early, M. A. Razzak and D. Bruce Sodee. St. Louis, 1969, Mosby. 378 p. Price: $15.50.
A Way of Life: By William Osler. Springfield, Ill., 1969, Thomas. 41 p. Price: $3.95.
William Osler, The Continued Education: By John P. McGovern and Charles G. Roland. Springfield, Ill., 1969, Thomas. 365 p. Price: Review.

Book Review

Psychiatry and the Criminal: By John M. MacDonald, MD, F.R.C.P. Second Edition, 1969. Charles C. Thomas, Springfield, Illinois.

Dr. Macdonald is Associate Professor of Psychiatry and Director of Forensic Psychiatry at the University of Colorado Medical Center, and includes in his new edition added chapters on: "Dangerousness; evaluation and treatment," "Narcotics and drug abuse," and "Check offenders and firesetters." The chapter on "Psychological test evaluation" is written by Leighton C. Whitaker, Ph.D., Assistant Professor of Psychology at the same school.

This book is a highly lucid and rewardingly informative text in forensic psychiatry, rendered the more readable thanks to Professor Macdonald's British wit, incisively apt case examples, and well organized presentation of practical data for both psychiatrists and testifying physicians—not to mention also for their legal colleagues. A few excerpts serve to illustrate the author's talent for penetrating analysis:

- Although "the M'Naghten rules" are traditionally so spelled over the years, "records of the Central Criminal Court show that the man himself signed his name McNaughton . . . ."
- "The suggestion that the hospital should recruit more psychiatrists to perform sanity examinations reminds one of the recipe for tiger stew which begins ——'First catch the tiger' "
- The present trend toward rapid discharge of patients from state mental hospitals has resulted in a return to the community of many chronic paranoid schizophrenics who have disregarded the prescribed tranquilizing drugs. Guttmacher's finding is cited of twenty cases of homicide by former psychiatric hospital patients.
- ". . . the following figures all express the same concentration of alcohol in the blood:"

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- Page 185 contains current slang for the enlightenment of straight physician not conversant with street labels of drugs—among them "horse" for heroin, "white stuff, hard stuff" for morphine, "snow" for cocaine, "speedball" for cocaine-heroin mixture, "Texas T, Acapulco gold" for marihauna, "co-pilots" for benzedrine, and "the button" for mescaline.
- Incredible variations in sentences of drug offenders are quoted from Kolb: An honorably discharged negro ex corporal given a 50-year sentence and $5,000 fine for sale of marihuana without previous arrest record, and a married negro woman given 20 years for concealing and transporting marihuana as her first offense-neither eligible for parole. Similarily, an amputee addicted to morphine was given 20 years for the sale of marihuana, a mentally retarded epileptic sentenced to life imprisonment after decoyed into selling heroin.
- "The term malingerer has unpleasant connotations, especially in a court of law, and should be avoided in medicolegal proceedings . . . . The story is told of a consulting physician who, walking into his ward one day with his intern, remarked, 'Well, how are they all this morning?' 'All doing excellently,' 'except the malingerer in the corner who died last night.' "
- "It cannot be overemphasized that malingering is not confined to the sane offender."
- "Society's divergent attitudes toward the same behavior in males and females is illustrated by the following apocryphal story. If a man walking past an apartment stops to watch a woman undressing before a window, the man is arrested as a peeper. If a woman walking past an apartment stops to watch a man undressing before a window, the man is arrested as an exhibitionist." (from B. M. Gebhard, *et al.* in *Sex Offenders).*
- Quoting Melvin Belli: "When any psychiatrist enters the courtroom, judge, as well as juror, figuratively take a few belligerent sniffs like the dog sniffing and sizing up the new mailman."
- Suggested response to an attorney's devastating surprise attack at the end of long cross examination: "At this juncture a request for a glass of water creates confusion in the courtroom as someone has to wake the elderly bailiff, and provides both refreshment and time to review dispassionately the significance of 'new information.' "

Psychologist Whitaker helpfully overviews psychologic evaluative tests forensically applicable and comments that "Where possible the psychologist should avoid esoteric and technical language . . . contribute whatever he can in the way of dynamic understanding, but, like the psychiatrist he should be sure that such formulations are based on the reality of the case, and not on artistic speculation."

Among Doctor Macdonald's added chapters of this new edition is that on "Check Offenders," which startlingly documents the extent and methodologies of this offense which probably results in the greatest loss to the community of any form of crime.

If the Reviewer's Code requires some negative indictment, this reader can manage only one—and that directed at the publisher for derelictions in editorial correction of typographic errors and minute inconsistencies; a tiny nuisance in the face of this valuable contribution to professional enlightment in forensic psychiatry. Rarely does one find so informative a text so painlessly readable, reflecting without pomposity or phony simplification "the way it is" with criminals, psychiatrists, lawyers, and courts.

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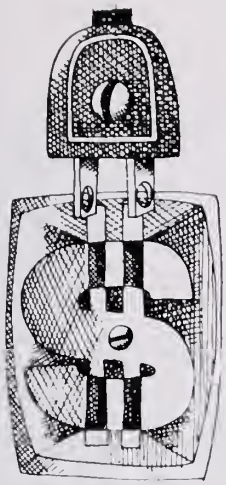

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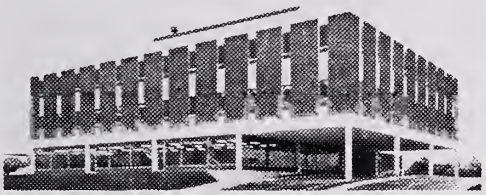

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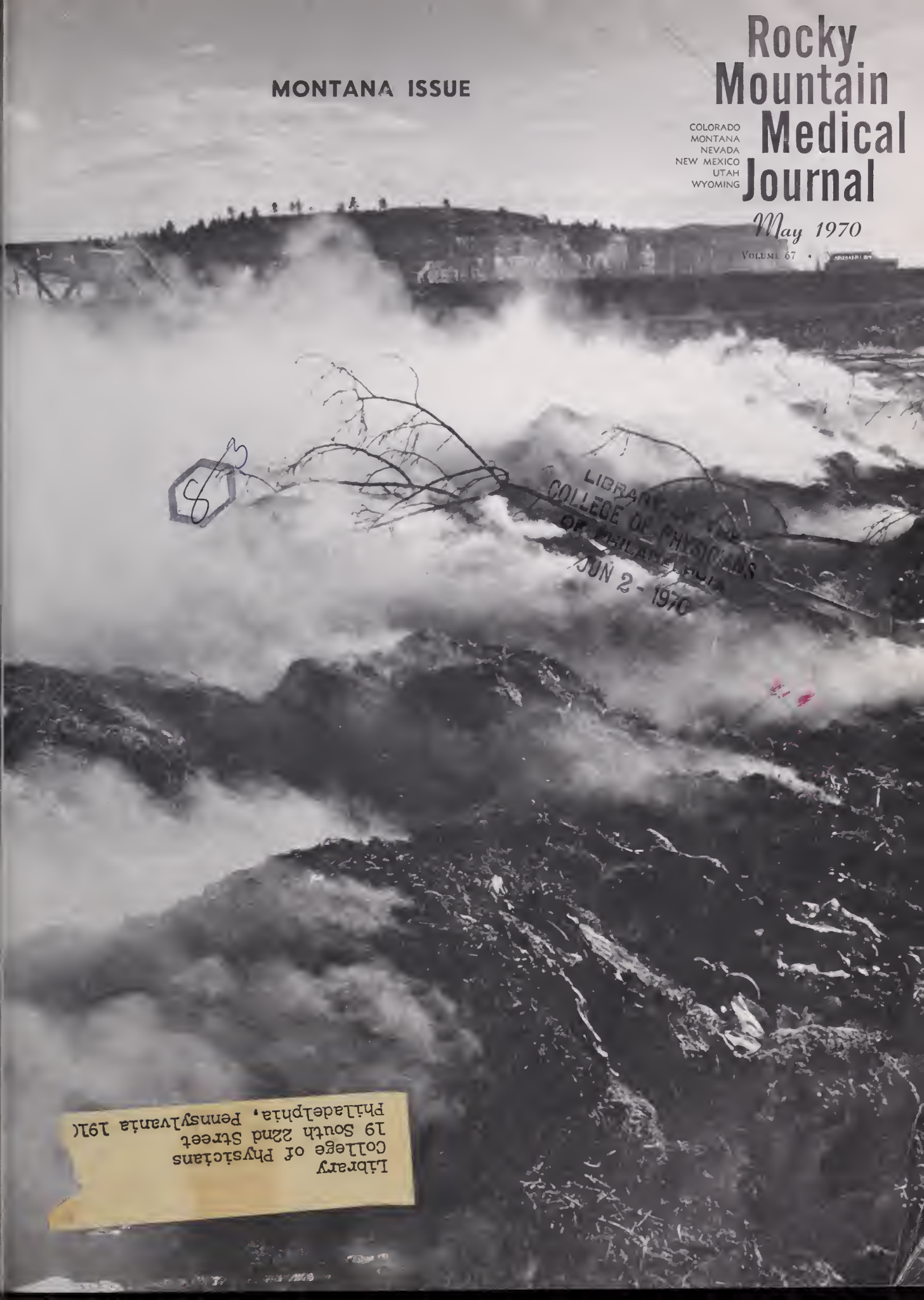

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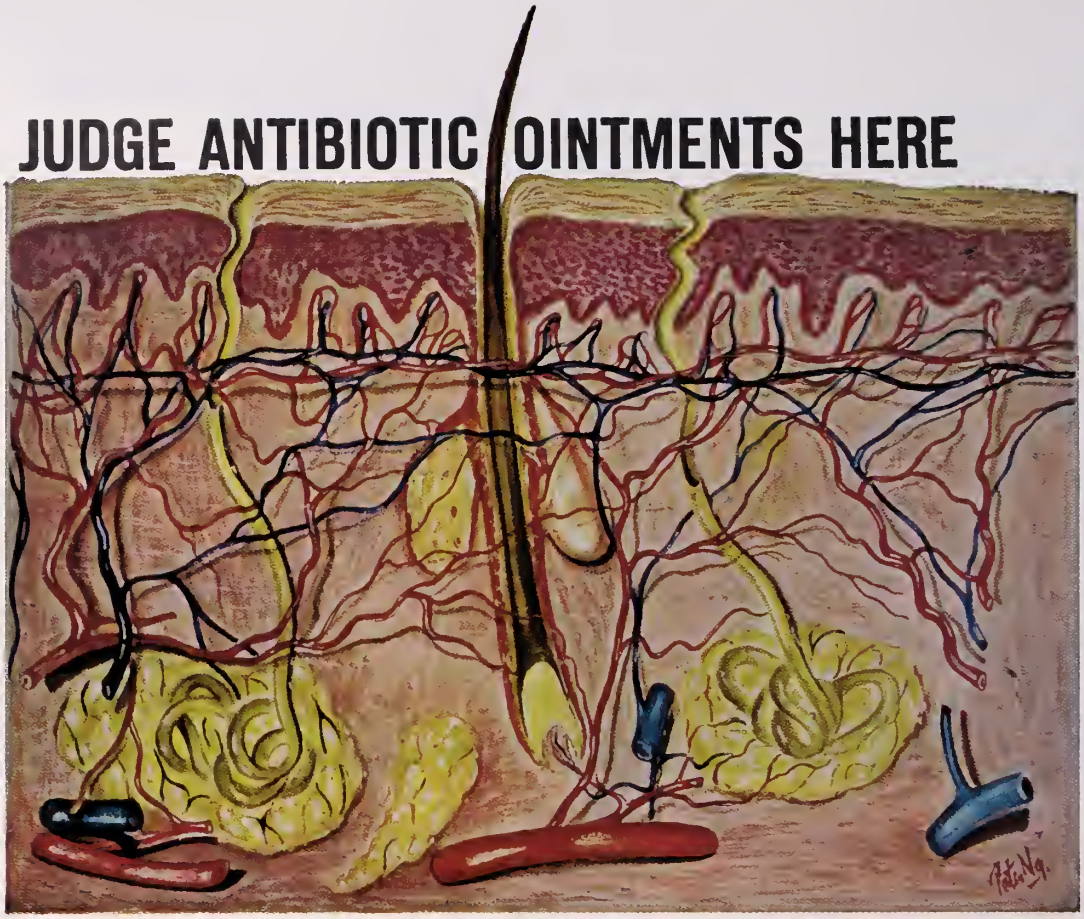

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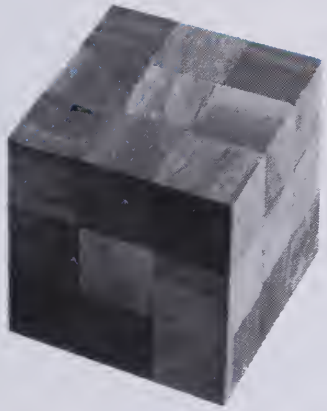

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LIQUID/TABLETS
aluminum and magnesium hydroxides plus simethicone

Good taste = patient acceptance
Relieves G.I. gas distress*
Non-constipating

*with the defoaming action of simethicone

Stuart PHARMACEUTICALS Pasadena, Calif. 91109
Division of Atlas Chemical Industries, Inc., Wilmington, Del. 19899

Smiles speak louder than words

for the good taste of Soyalac

Milk-free, hypo-allergenic Soyalac has a pleasing taste that is eagerly accepted by most infants. It's similar to mother's milk in composition and assimilation, much like cow's milk in consistency and completely free of fibre. Extensive clinical data support Soyalac's value in promoting growth and development. Soyalac is also excellent for growing children and adults.

Available in
Concentrated Liquid or Powdered

Free Booklet and Samples

A request on your professional letterhead or prescription form will bring to you complete information and a supply of samples.

Soyalac

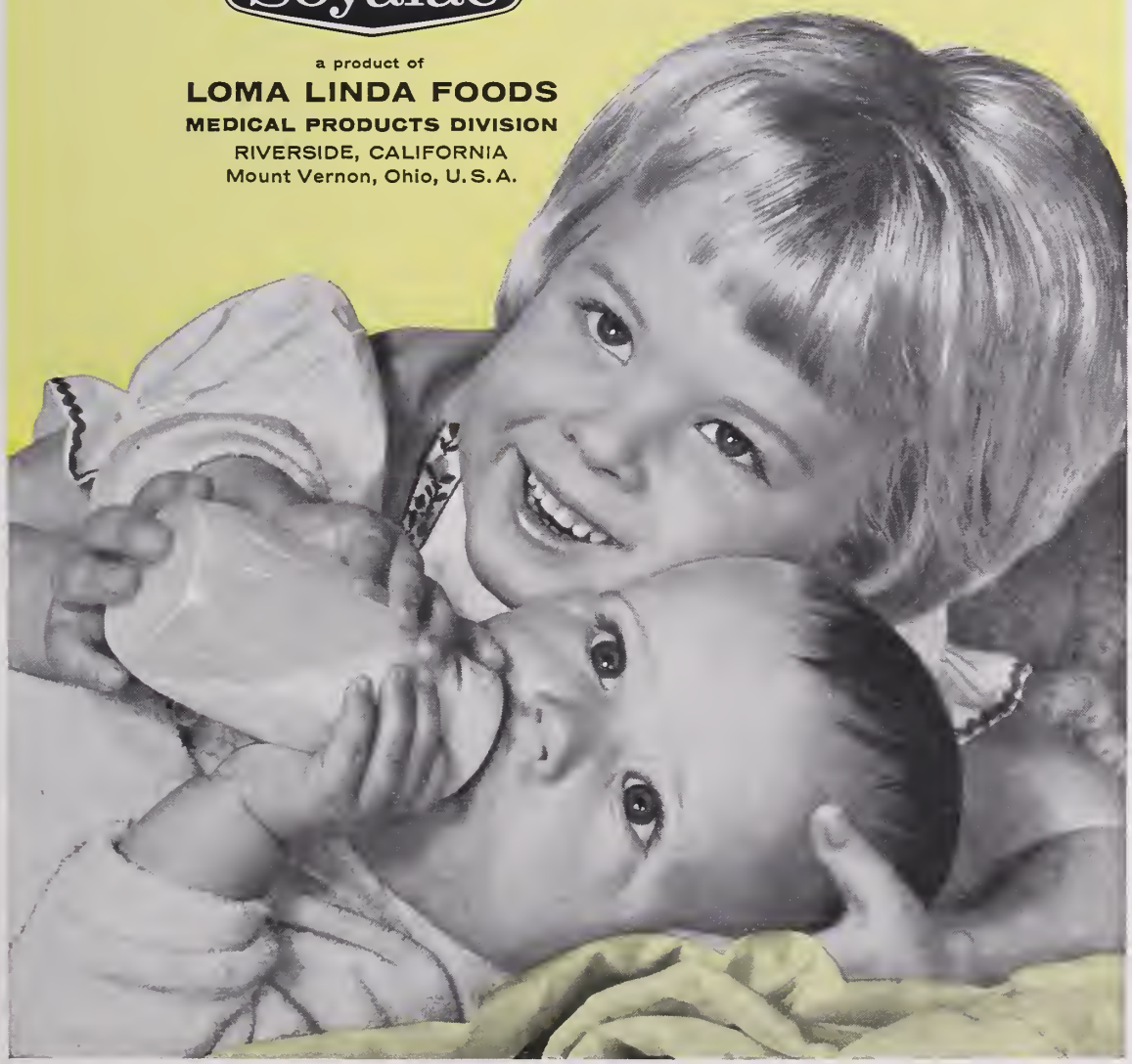
a product of

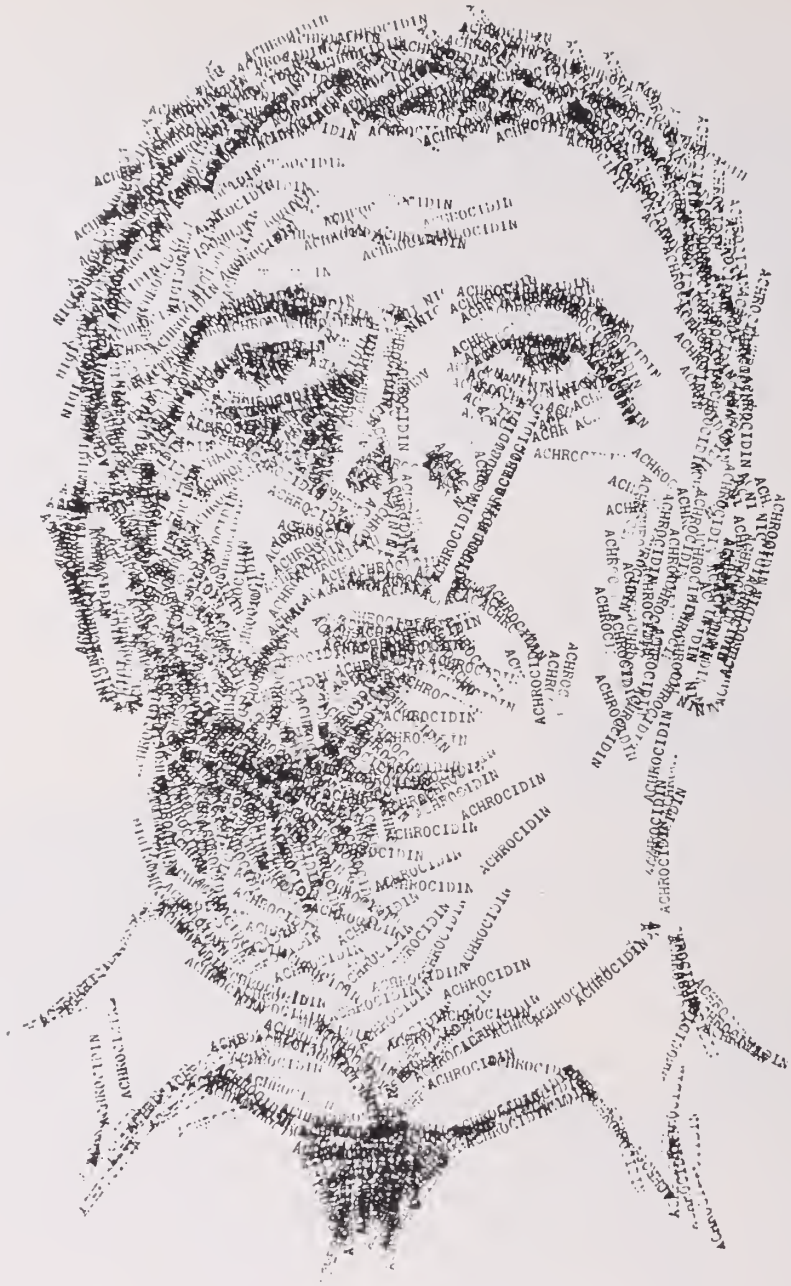
LOMA LINDA FOODS

MEDICAL PRODUCTS DIVISION

RIVERSIDE, CALIFORNIA

Mount Vernon, Ohio, U.S.A.





Achrocidin® Tablets and Syrup

Tetracycline HCl—Antihistamine—Analgesic Compound

Each tablet contains: ACHROMYCIN® Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Caffeine 30 mg.; Salicylamide 150 mg.; Chlorothen Citrate 25 mg.

ACHROCIDIN Tetracycline HCl—Antihistamine—Analgesic Compound Tablets and Syrup are recommended for the treatment of tetracycline-sensitive bacterial infection which may complicate vasomotor rhinitis, sinusitis and other allergic diseases of the upper respiratory tract, and for the concomitant symptomatic relief of headache and nasal congestion. For children and elderly patients you may prefer caffeine-free ACHROCIDIN Syrup. Each 5 cc contains: ACHROMYCIN Tetracycline equivalent to Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Salicylamide 150 mg.; Ascorbic Acid (C) 25 mg.; Pyrilamine Maleate 15 mg.

Contraindications: Hypersensitivity to any component.

Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.

Precautions: Drowsiness, anorexia, slight gastric distress can occur. In excessive drowsiness, consider longer dosage intervals. Persons on full dosage should not operate vehicles. Nonsusceptible organisms may overgrow; treat superinfection appropriately. Treat beta-hemolytic streptococcal infections at least 10 days to help prevent rheumatic fever or acute glomerulonephritis. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).

Adverse Reactions: *Gastrointestinal*—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. *Skin*—maculopapular and erythematous rashes; exfoliative dermatitis; photosensitivity; onycholysis, nail discoloration. *Kidney*—dose-related rise in BUN. *Hypersensitivity reactions*—urticaria, angioneurotic edema, anaphylaxis. *Intracranial*—bulging fontanels in young infants. *Teeth*—yellow-brown staining; enamel hypoplasia. *Blood*—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. *Liver*—cholestasis at high dosage.

Upon adverse reaction, stop medication and treat appropriately.

Lederle LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York 10965

535-9

Picture of torticollis

treated with Parafon Forte® TABLETS

Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility... stop pain-spasm feedback by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

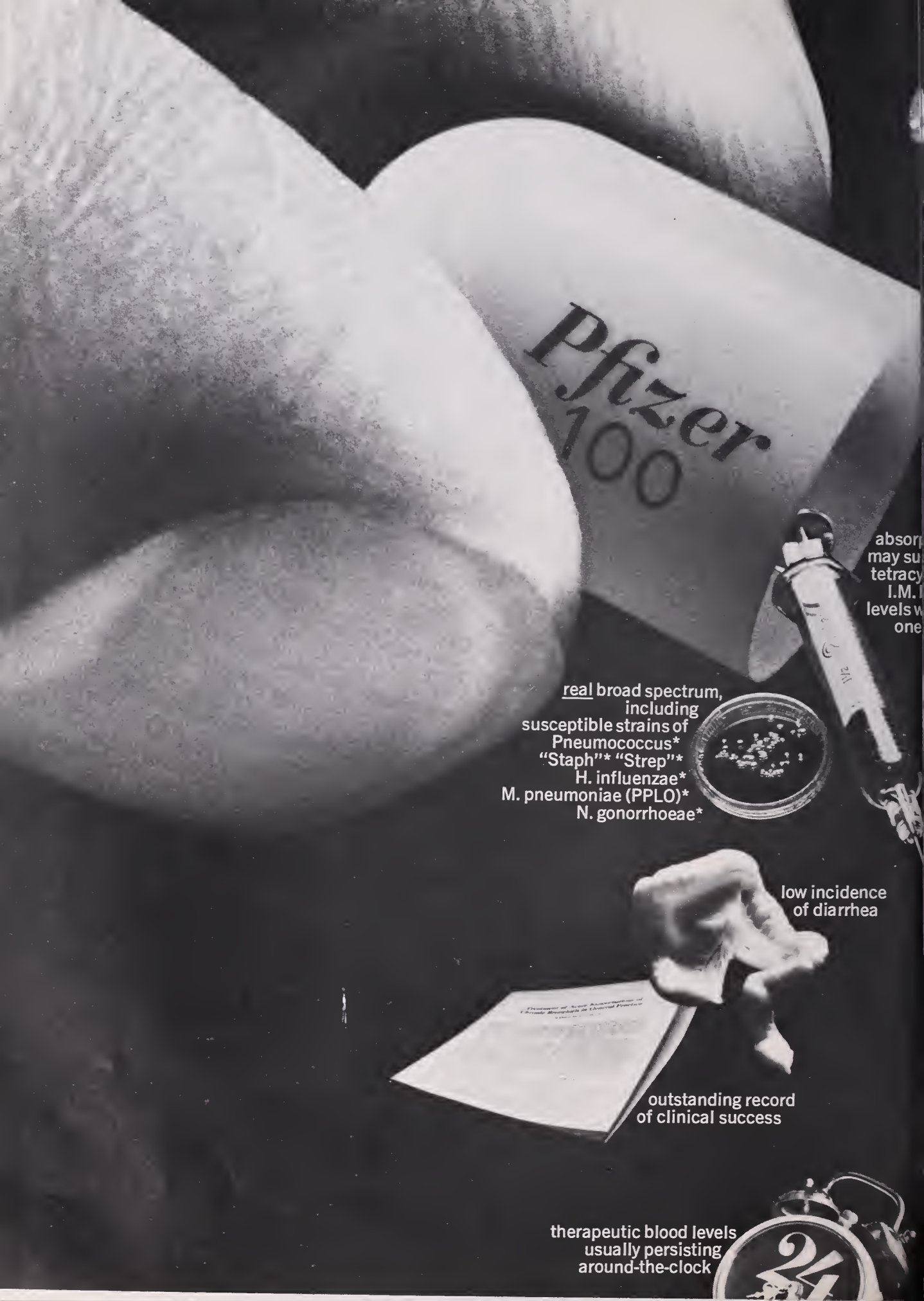
Contraindications: Sensitivity to either component. ***Precautions:*** Exercise caution in patients with known allergies or history of drug allergies. If a sensitivity reaction or signs or symptoms suggestive of liver dysfunction are observed, the drug should be stopped. ***Adverse Reactions:*** Occasionally, drowsiness, dizziness, lightheadedness, malaise, overstimulation or gastrointestinal disturbances may be noted; rarely, allergic-type skin rashes, petechiae, ecchymoses, angioneurotic edema or anaphylactic reactions. In rare instances, *Paraflex* (chlorzoxazone) may possibly have been associated with gastrointestinal bleeding. While *Paraflex* (chlorzoxazone) and chlorzoxazone-containing products have been suspected as being the cause of hepatic toxicity in approximately eighteen patients, it was not possible to state that the dysfunction was or was not drug induced. ***Usual Adult Dosage:*** Two tablets q.i.d. ***Supplied:*** Scored, light green tablets, imprinted "McNEIL"—bottles of 100.

References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

McNEIL

McNEIL LABORATORIES, INC., FT. WASHINGTON, PA. 19034

*U.S. PATENT NO. 2,895,877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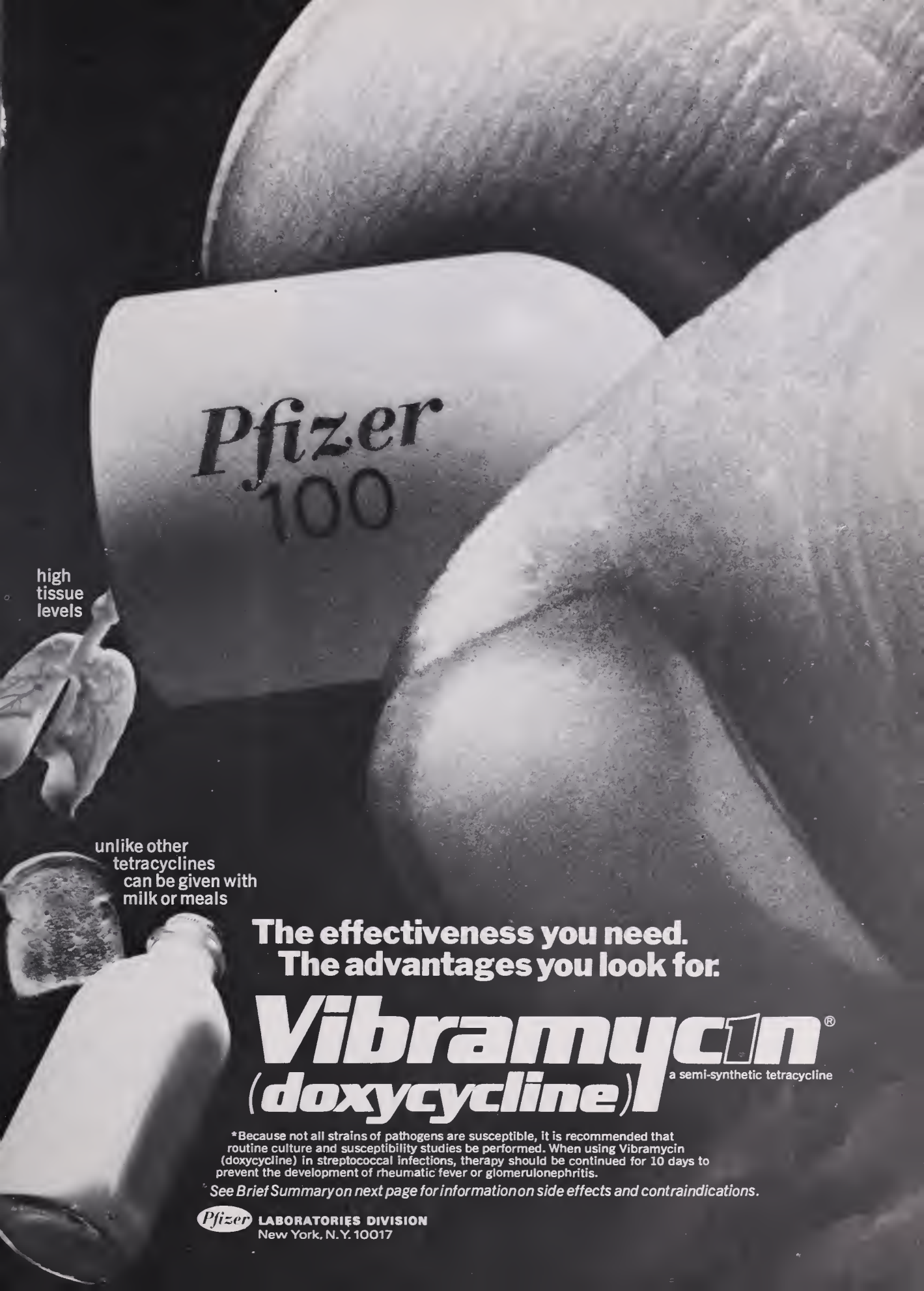


The effectiveness you need.
The advantages you look for.

Vibramycin® (doxycycline)

a semi-synthetic tetracycline

*Because not all strains of pathogens are susceptible, it is recommended that routine culture and susceptibility studies be performed. When using Vibramycin (doxycycline) in streptococcal infections, therapy should be continued for 10 days to prevent the development of rheumatic fever or glomerulonephritis.

See Brief Summary on next page for information on side effects and contraindications.

Pfizer LABORATORIES DIVISION
New York, N.Y. 10017

and convenience too.

The unique new Vibramycin (doxycycline) V-Pak is especially convenient for use both in your office practice and in the hospital outpatient department. It contains a typical four-day course of therapy for routine infections with easy-to-understand patient instructions. The dosage is low, just 100 mg. b.i.d. the first day followed by 100 mg. once a day for the next three days. In more severe infections, 100 mg. q.12 h. is recommended. If renal impairment exists, lower than usual doses are indicated.

And for added convenience in the hospital pharmacy, Vibramycin is available in unit-dose packs of 100 (10 x 10's) for both the 100 mg. and the 50 mg. capsules.

VIBRAMYCIN® (doxycycline)
BRIEF SUMMARY

Contraindicated: In individuals who have shown hypersensitivity to doxycycline.

Warnings: The usual dosage and frequency of administration of Vibramycin (doxycycline) differs from those of other tetracyclines. Exceeding the recommended dosage may result in an increased incidence of side effects.

If renal impairment exists, even usual doses may lead to excessive accumulation of the drug and possible hepatic toxicity. For such patients, lower than usual doses are indicated and, if treatment is prolonged, Vibramycin serum level determinations may be advisable.

Vibramycin, like other tetracyclines, may form a stable calcium complex in any bone-forming tissue, although *in vitro* Vibramycin binds calcium less strongly than other tetracyclines. The use of Vibramycin during tooth development (last trimester of pregnancy, neonatal period, and early childhood) may cause discoloration of the teeth (yellow-gray-brownish). This effect may occur mostly during long-term use, but also may occur with short-treatment courses.

Increased intracranial pressure with bulging fontanelles has been observed in infants receiving tetracyclines. This effect has disappeared rapidly on cessation of therapy with no sequelae.

In certain hypersensitive individuals treated with Vibramycin, exposure to direct sunlight may precipitate a photodynamic reaction. In individuals with a history of photoallergic reactions to tetracyclines, exposure to direct sunlight should be avoided and treatment should be discontinued at first evidence of skin discomfort.

Precautions: As with any antibiotic, overgrowth of nonsusceptible organisms may occasionally occur. Constant observation of the patient is essential. If such superinfections are encountered, Vibramycin should be discontinued and replaced by appropriate therapy.

When treating gonorrhea in which lesions of primary or secondary syphilis are suspected, proper diagnostic procedures, including dark-field examinations, should be utilized. In all cases in which concomitant syphilis is suspected, monthly serological tests should be made for at least four months.

Adverse Reactions: Nausea, vomiting, diarrhea, vaginitis, as well as reactions of an allergic nature such as dermatitis, urticaria, and anaphylaxis may occur but are rare. Glossitis, stomatitis, proctitis, onycholysis and discoloration of the nails may rarely occur during tetracycline therapy as with other antibiotics. If severe adverse reactions, individual idiosyncrasy, or allergy occur, discontinue medication.

As with other tetracyclines, elevation of SGOT or SGPT values, or elevated BUN have been reported, the significance of which is not known at this time. Anemia, neutropenia, and eosinophilia have been reported, as with other tetracyclines.

Animal Pharmacology: As with other tetracyclines, at doses greater than those recommended for human usage, Vibramycin produces discoloration of animal thyroid glands. Careful monitoring of animals and humans has disclosed no abnormalities of thyroid function studies. Also, as with other tetracyclines, at relatively high oral doses, evidence of hepatotoxicity has been noted in dogs and signs of gastrointestinal intolerance have been seen in both dogs and monkeys.

Dosage: The usual dose of Vibramycin is 200 mg. on the first day of treatment (administered 100 mg. every 12 hours) followed by a maintenance dose of 100 mg./day. The maintenance dose may be administered as a single dose, or as 50 mg. every 12 hours. In the management of more severe infections (particularly chronic infections of the urinary tract), 100 mg. every 12 hours is recommended. The recommended dosage schedule for children weighing 100 pounds or less is 2 mg./lb. of body weight divided into two doses on the first day of treatment, followed by 1 mg./lb. of body weight given as a single daily dose or divided into two doses, on subsequent days. For more severe infections up to 2 mg./lb. of body weight may be used. For children over 100 lbs. the usual adult dose should be used.

Acute gonococcal anterior urethritis in males —a single dose of 300 mg. or 100 mg. b.i.d. for 2-4 days.

Acute gonococcal infections in the adult female should be treated with doses of 100 mg. b.i.d. until cure is effected.

Therapy should be continued beyond the time that symptoms and fever have subsided. When used in streptococcal infections, therapy should be continued for 10 days to prevent the development of rheumatic fever or glomerulonephritis.

If gastric irritation occurs, it is recommended that Vibramycin be given with food or milk. Studies indicate that the absorption of Vibramycin is not markedly influenced by simultaneous ingestion of food or milk.

Simultaneous administration of aluminum hydroxide gel given with tetracycline antibiotics including Vibramycin has been shown to decrease absorption.

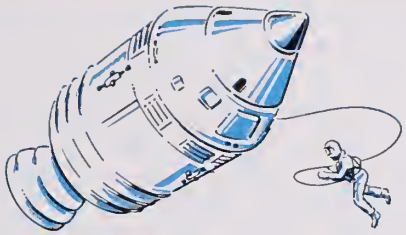
Supply: Vibramycin Hyclate (doxycycline hyclate) is available as capsules containing doxycycline hyclate equivalent to 50 mg. of doxycycline, bottles of 50, unit-dose pack of 100 (10 x 10's), and X pack of 50 (5 x 10's); capsules containing doxycycline hyclate equivalent to 100 mg. of doxycycline, bottles of 50, unit-dose pack of 100 (10 x 10's), and V pack of 25 (5 x 5's).

Vibramycin Monohydrate (doxycycline monohydrate) is available as a dry powder for oral suspension containing when reconstituted doxycycline monohydrate equivalent to 25 mg. of doxycycline per 5 cc. (each teaspoonful), with a pleasant-tasting raspberry flavor, 2 oz. bottles.

More detailed professional information available on request.

Pfizer LABORATORIES DIVISION
New York, N.Y. 10017

Vibramycin®
(doxycycline)
a semi-synthetic tetracycline



Man in space, now fait accompli, re-emphasizes the importance of Uro-Phosphate therapy. Research into the effect of space travel on the astronaut reveals that weightlessness causes loss of bone calcium. As the bones are required to bear less and less of the weight of the body they lose calcium, increasing the calcium content of the urine. When physical activity is reduced, the acidity of the urine should be adjusted to keep increased calcium in solution . . . . a prophylaxis to prevent kidney or bladder calculi.

Uro-Phosphate®

NOW A SUGAR-COATED TABLET

Each tablet contains: METHENAMINE, *300 mg.;* SODIUM ACID PHOSPHATE, *500 mg.*

Uro-Phosphate gives comfort and protection when inactivity causes discomfort in the urinary function. It keeps calcium in solution, preventing calculi; it maintains clear, acid, sterile urine; it encourages complete voiding and lessens frequency when residual urine is present.

Uro-Phosphate contains sodium acid phosphate, a natural urinary acidifier. This component is fortified with methenamine which is inert until it reaches the acid urinary bladder. In this environment it releases a mild antiseptic keeping the urine sterile.

Uro-Phosphate is safe for continuous use. There are no contra-indications other than acidosis. It can be given in sufficient amount to keep the urine clear, acid and sterile. A heavy sugar coating protects its potency.

Dosage:

For protection of the inactive patient 1 or 2 tablets every 4 to 6 hours is usually sufficient to keep the urine clear, acid and sterile.

2 tablets on retiring will keep residual urine acid and sterile, contributing to comfort and rest.

A clinical supply will be sent to physicians and hospitals on request.

WILLIAM P. POYTHRESS & COMPANY, INC., RICHMOND, VIRGINIA 23217

Manufacturers of Ethical Pharmaceuticals

in active stages of moderate to severe rheumatoid arthritis

What more can you

after you've tried

rheumatoid spondylitis, and osteoarthritis of the hip

do for these patients?

salicylates and rest

INDOCIN®

(INDOMETHACIN | MSD)

helps relieve pain, fever,
swelling, and tenderness

Please see new prescribing information on following page.

REVISED PRESCRIBING INFORMATION

IMPORTANT NOTE: INDOCIN (Indomethacin, MSD) cannot be considered a simple analgesic and should not be used in conditions other than those recommended under Indications. The drug should not be prescribed for children because safe conditions for use have not been established.

General Adverse Effects: Because of the high potency of the drug and the variability of its potential to cause adverse reactions, the following are strongly recommended: 1) the lowest possible effective dose for the individual patient should be prescribed. Increased dosage tends to increase adverse effects, particularly in doses over 150-200 mg/day, without corresponding clinical benefits; and 2) careful instructions to, and observations of, the individual patients are essential to the prevention of serious and irreversible, including fatal, adverse reactions, especially in the aging patient.

Indications: Symptomatic relief of adult rheumatoid and degenerative joint disease unresponsive to adequate trial of salicylates and other measures of established value, such as appropriate rest. Has been found effective in active stages of: 1) moderate to severe rheumatoid arthritis including acute flares of chronic disease, 2) moderate to severe rheumatoid (ankylosing) spondylitis, and 3) moderate to severe degenerative joint disease of the hip (osteoarthritis of the hip). Has been found effective in relieving pain and reducing fever, swelling, and tenderness in acute gouty arthritis in selected patients. May enable reduction of steroid dosage in patients receiving steroids for the more severe forms of rheumatoid arthritis; in such instances the steroid dosage should be reduced slowly and the patients followed very closely for any possible adverse effects.

Contraindications: Children 14 years of age and under; pregnant women and nursing mothers; active gastrointestinal lesions or history of recurrent gastrointestinal lesions; allergy to aspirin and indomethacin.

Warnings: *Gastrointestinal Effects:* Because of the occurrence and, at times, severity of gastrointestinal reactions, be continuously alert for any sign or symptom signaling a possible gastrointestinal reaction. The risks of continuing therapy with INDOCIN in the face of such symptoms must be weighed against the possible benefits to the individual patient. Gastrointestinal effects may be reduced by giving the drug immediately after meals, with food, or with antacids. Use greater care in aging patients.
Ocular Effects: Corneal deposits and retinal disturbances, including those of the macula, have been observed in some patients on prolonged therapy. Discontinue therapy if such changes are observed. Ophthalmologic examination at periodic intervals is desirable in patients on prolonged therapy.
Central Nervous System Effects: INDOCIN (Indomethacin, MSD) may aggravate psychiatric disturbances, epilepsy, and parkinsonism, and should be used with considerable caution in patients with these conditions. If severe CNS reactions develop, discontinue the drug.

Precautions: Blurred vision may be a significant symptom that warrants a thorough ophthalmologic examination. Patients should be cautioned about engaging in activities requiring mental alertness and motor coordination, as driving a car. Headache which persists despite dosage reduction requires complete cessation of the drug. May mask the usual signs and symptoms of infection; therefore, the physician must be continually on the alert for this and should use the drug with extra care in the presence of existing controlled infection. After the acute phase of the disease is under control, an attempt to reduce the daily dose should be made repeatedly until the patient is off entirely.

Adverse Reactions: *Gastrointestinal Reactions:* Single or multiple ulcerations of the esophagus, stomach, duodenum, or small intestine, including perforation and hemorrhage, with fatalities in some instances; gastrointestinal bleeding without obvious ulcer formation; perforation of preexisting sigmoid lesions (diverticulum, carcinoma, etc.); rarely, increased abdominal pain in ulcerative colitis patients or development of ulcerative colitis and regional ileitis; gastritis, which may persist after the cessation of the drug; nausea, vomiting, anorexia, epigastric distress, abdominal pain, and diarrhea.
Eye Reactions: Corneal deposits and retinal disturbances, including those of the macula, have been observed on prolonged therapy; blurring of vision.
Hepatic Reactions: Rarely, toxic hepatitis and jaundice, including some fatal cases.
Hematologic Reactions: Aplastic anemia, hemolytic anemia, bone marrow depression, agranulocytosis, leukopenia, and thrombocytopenic purpura. Since some patients manifest anemia secondary to obvious or occult gastrointestinal bleeding, appropriate blood determinations are recommended.
Hypersensitivity Reactions: Acute respiratory distress, including dyspnea and asthma; angiitis; pruritus; urticaria; angioedema; skin rashes.
Ear Reactions: Hearing disturbances, deafness, tinnitus.
Central Nervous System Reactions: Psychotic episodes, depersonalization, depression, coma, convulsions, peripheral neuropathy, drowsiness, mental confusion, lightheadedness, dizziness, headache.
Cardiovascular-Renal Reactions: Edema, elevation of blood pressure, hematuria.
Dermatologic Reactions: Loss of hair, erythema nodosum.
Miscellaneous: Rarely, vaginal bleeding, hyperglycemia, glycosuria, ulcerative stomatitis, and epistaxis.

Supplied: Capsules containing 25 mg indomethacin each, in bottles of 100 and 1000; capsules containing 50 mg indomethacin each, in bottles of 100.

For more detailed information, consult your Merck Sharp & Dohme representative or see the package circular.

MERCK SHARP & DOHME | **where today's theory is tomorrow's therapy**
Division of Merck & Co. Inc. West Point Pa 19486

Painful night leg cramps...

unwelcome bedfellow for any patient– including those with arthritis, diabetes or PVD

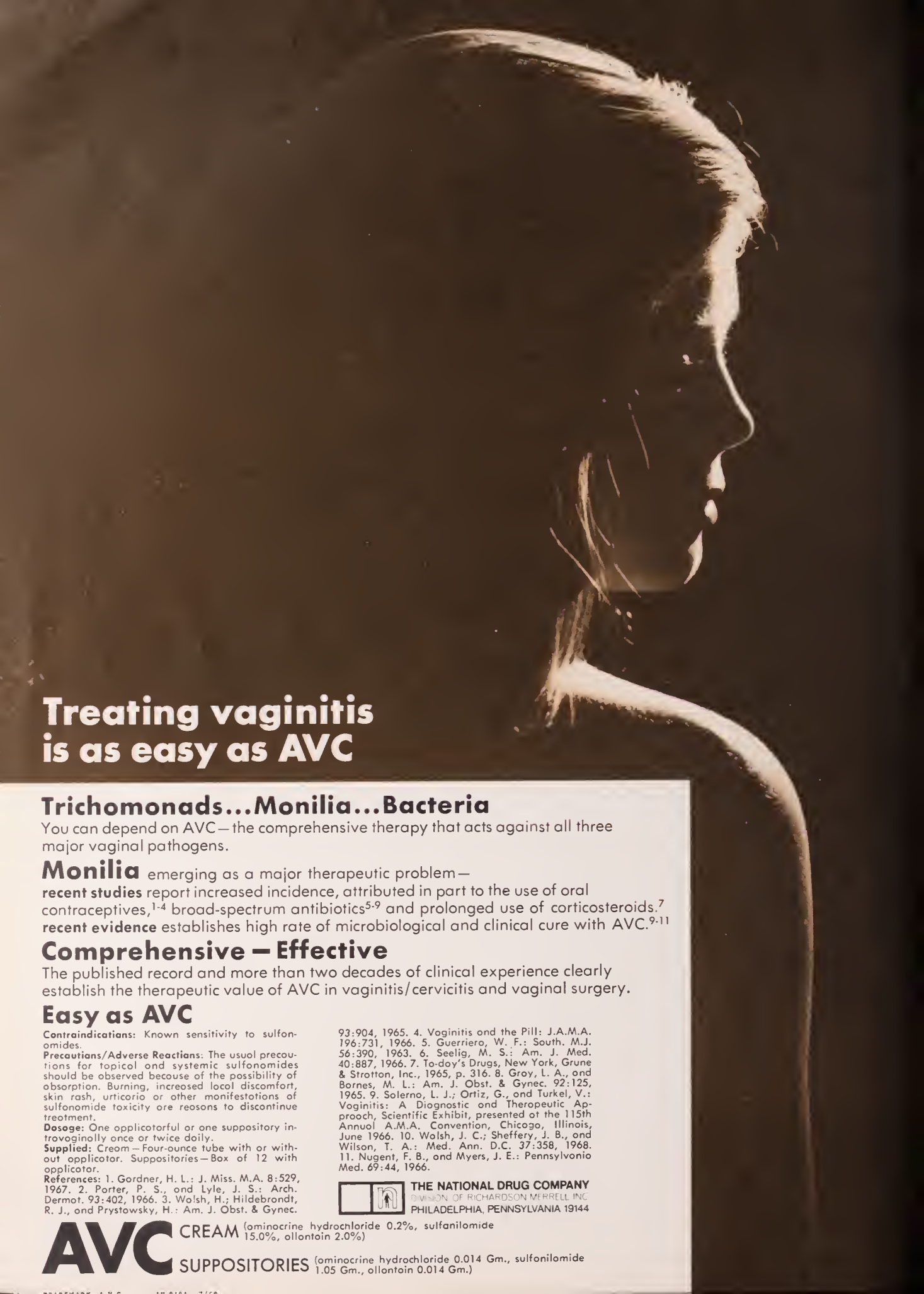
One thing patients can sleep without, particularly patients with chronic disease conditions such as arthritis, diabetes or PVD, is painful night leg cramps. Although seldom the presenting complaint, night leg cramps can tie your patients up in painful knots. Now, just one tablet of QUINAMM at bedtime can usually bring an end to shattered sleep and needless suffering. Your patients will sleep restfully—gratefully—with QUINAMM, specific therapy to prevent painful night leg cramps.

Prescribing Information—Composition: Each white, beveled, compressed tablet contains: Quinine sulfate, 260 mg., Aminophylline, 195 mg. **Indications:** For the prevention and treatment of nocturnal and recumbency leg muscle cramps, including those associated with arthritis, diabetes, varicose veins, thrombophlebitis, arteriosclerosis and static foot deformities. **Contraindications:** QUINAMM is contraindicated in pregnancy because of its quinine content. **Precautions/Adverse Reactions:** Aminophylline may produce intestinal cramps in some instances, and quinine may produce symptoms of cinchonism, such as tinnitus, dizziness, and gastrointestinal disturbance. Discontinue use if ringing in the ears, deafness, skin rash, or visual disturbances occur. **Dosage:** One tablet upon retiring. Where necessary, dosage may be increased to one tablet following the evening meal and one tablet upon retiring. **Supplied:** Bottles of 100 and 500 tablets.

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144

Quinamm™
(quinine sulfate 260 mg., aminophylline 195 mg.)

Specific therapy for night leg cramps



Treating vaginitis is as easy as AVC

Trichomonads...Monilia...Bacteria

You can depend on AVC—the comprehensive therapy that acts against all three major vaginal pathogens.

Monilia emerging as a major therapeutic problem—
recent studies report increased incidence, attributed in part to the use of oral contraceptives,[1-4] broad-spectrum antibiotics[5-9] and prolonged use of corticosteroids.[7]
recent evidence establishes high rate of microbiological and clinical cure with AVC.[9-11]

Comprehensive — Effective

The published record and more than two decades of clinical experience clearly establish the therapeutic value of AVC in vaginitis/cervicitis and vaginal surgery.

Easy as AVC

Contraindicatians: Known sensitivity to sulfonomides.
Precautians/Adverse Reactians: The usuol precoutions for topicol ond systemic sulfonomides should be observed becouse of the possibility of obsorption. Burning, increosed locol discomfort, skin rash, urticorio or other monifestotions of sulfonomide toxicity ore reosons to discontinue treotment.
Dosoge: One opplicotorful or one suppository introvoginolly once or twice doily.
Supplied: Creom—Four-ounce tube with or without opplicotor. Suppositories—Box of 12 with opplicotor.

References: 1. Gordner, H. L.: J. Miss. M.A. 8:529, 1967. 2. Porter, P. S., ond Lyle, J. S.: Arch. Dermot. 93:402, 1966. 3. Wolsh, H.; Hildebrondt, R. J., ond Prystowsky, H.: Am. J. Obst. & Gynec. 93:904, 1965. 4. Voginitis ond the Pill: J.A.M.A. 196:731, 1966. 5. Guerriero, W. F.: South. M.J. 56:390, 1963. 6. Seelig, M. S.: Am. J. Med. 40:887, 1966. 7. To-doy's Drugs, New York, Grune & Stratton, Inc., 1965, p. 316. 8. Groy, L. A., ond Bornes, M. L.: Am. J. Obst. & Gynec. 92:125, 1965. 9. Solerno, L. J.; Ortiz, G., ond Turkel, V.: Voginitis: A Diognostic ond Theropeutic Approoch, Scientific Exhibit, presented ot the 115th Annuol A.M.A. Convention, Chicogo, Illinois, June 1966. 10. Wolsh, J. C.; Sheffery, J. B., ond Wilson, T. A.: Med. Ann. D.C. 37:358, 1968. 11. Nugent, F. B., ond Myers, J. E.: Pennsylvonio Med. 69:44, 1966.

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144

AVC CREAM (ominocrine hydrochloride 0.2%, sulfanilomide 15.0%, ollontoin 2.0%)

SUPPOSITORIES (ominocrine hydrochloride 0.014 Gm., sulfonilomide 1.05 Gm., ollontoin 0.014 Gm.)

I love my family.
I adore this house.
My in-laws are great.
The neighbors are wonderful.

Indications: For use in management of anxiety and tension occurring alone or as accompanying symptom complex to medical and surgical disorders and procedures. Though not a hypnotic, fosters normal sleep through antianxiety and related muscle-relaxant properties.

Contraindications: History of sensitivity to meprobamate.

Important Precautions: Carefully supervise dose and amounts prescribed, especially for patients prone to overdose themselves. Excessive prolonged use has been reported to result in dependence or habituation in susceptible persons, as alcoholics, ex-addicts, and other severe psychoneurotics. After prolonged excessive dosage, reduce dosage gradually to avoid possibly severe withdrawal reactions. Abrupt discontinuance of excessive doses has sometimes resulted in epileptiform seizures.

Warn patients of possible reduced alcohol tolerance, with resultant slowing of reaction time and impairment of judgment and coordination.

Reduce dose if drowsiness, ataxia or visual disturbance occurs; if persistent, patients should not operate vehicles or dangerous machinery.

Side Effects include drowsiness, usually transient; if persistent and associated with ataxia, usually responds to dose reduction, occasionally concomitant CNS stimulants (amphetamine, mephentermine sulfate) are desirable. Allergic or idiosyncratic reactions are rare, but such reactions, sometimes severe, can develop in patients receiving only 1 to 4 doses who have had no previous contact with meprobamate. Previous history of allergy may or may not be related to incidence of reactions. Mild reactions are characterized by itchy urticarial or erythematous maculopapular rash, generalized or confined to groin. Acute nonthrombocytopenic purpura with cutaneous petechiae, ecchymoses, peripheral edema and fever have been reported. One fatal case of bullous dermatitis following intermittent use of meprobamate with prednisolone has been reported. If allergic reaction occurs, meprobamate should be stopped and not reinstituted. Severe reactions, observed very rarely, include angioneurotic edema, bronchial spasms, fever, fainting spells, hypotensive crises (1 fatal case), anaphylaxis, stomatitis and proctitis (1 case) and hyperthermia. Treat symptomatically as with epinephrine, antihistamine and possibly hydrocortisone. Aplastic anemia (1 fatal case), thrombocytopenic purpura, agranulocytosis and hemolytic anemia have occurred rarely, almost always in presence of known toxic agents. A few cases of leukopenia, usually transient, have been reported on continuous administration.

Meprobamate may sometimes precipitate grand mal attacks in patients susceptible to both grand and petit mal. Extremely large doses can produce rhythmic fast activity in the cortical pattern. Impairment of accommodation and visual acuity has been reported rarely. After excessive dosage for weeks or months, withdraw gradually (1 or 2 weeks) to avoid recurrence of pretreatment symptoms (insomnia, severe anxiety, anorexia). Abrupt discontinuance of excessive doses has sometimes resulted in vomiting, ataxia, tremors, muscle twitching and epileptiform seizures. Prescribe very cautiously and in small amounts for patients with suicidal tendencies. Suicidal attempts have resulted in coma, shock, vasomotor and respiratory collapse and anuria. Excessive doses have resulted in prompt sleep, reduction of blood pressure, pulse and respiratory rates to basal levels; and occasionally hyperventilation. Treat with immediate gastric lavage and appropriate symptomatic therapy. (CNS stimulants and pressor amines as indicated). Doses above 2400 mg./day are not recommended.

Composition. Tablets, 200 mg. and 400 mg. meprobamate. Coated Tablets, WYSEALS® EQUANIL (meprobamate) 400 mg. (All tablets also available in REDIPAK® (strip pack), Wyeth.) Continuous-Release Capsules, EQUANIL L-A (meprobamate) 400 mg.

The young homemaker: her underlying anxiety and tension can surface and intensify under the continuous stress of rearing a growing family. Especially when she's confined to the home and its environs so much.

You can help her over the rough spots with reassurance and counsel. Equanil can help relieve tension, ease anxiety—with little risk of serious side effects. Time and experience will probably do the rest.

Equanil®
(meprobamate)

Wyeth Laboratories
Philadelphia, Pa.

Photo professionally posed.

Doctor, after all we've been through together...

abscess
acne
amebiasis
anthrax
bacillary dysentery
bartonellosis
bronchitis
bronchopulmonary infection
brucellosis
chancroid
diphtheria
endocarditis
genitourinary infections
gonorrhea
granuloma inguinale
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lymphogranuloma
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osteomyelitis
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Pollution of Our Environment

THE WORD "POLLUTION" rings far and wide across our land. To most of us, it brings unhappy thoughts and unpleasant emotions. It strikes fear into the hearts of leaders of industry who find themselves in a position of being forced to make costly modifications of their plants and mills, or be forced out of business for failure to comply with pollution control standards. Our President calls for the spending of 10 billion dollars to help halt the progress of this problem.

Many of the advances of mankind have come at a cost to his environment. Now it appears that the price must be paid for our past indiscretions and great care taken that we do not continue to make the same or even worse mistakes. Our Creator made the Earth with marvelously wide margins of safety. We in the Rocky Mountain area are fortunate to enjoy the ultimate of His blessings as to our surroundings, but none needs to travel far to see flagrant abuses of the land, water or atmosphere.

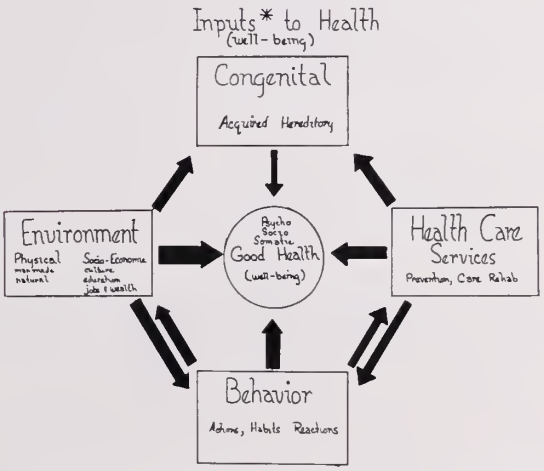
Physicians are in a particularly important position in pollution control. People look to us for advice and counsel in all matters pertaining to health, and this is no exception. Because of this, we have a great opportunity to exert a substantial beneficial influence. If each physician would take upon himself a personal commitment to make every effort to help resolve the pollution problems in the community he serves, the cumulative result would be tremendous. The place to assure proper sewage treatment and to prevent raw sewage or other contaminants from being dumped into our waters is at the local level. Sanitary garbage disposal is a community problem. Air pollution control standards and regulation of hard pesticides and other soil contaminants require governmental action but, in the end, local recognition of violations and push for enforcement will be essential.

The problem is at hand. Our help is needed. Will *you* accept the challenge?

Oscar A. Swenson, MD
President, Montana Medical Association.

Environment—Not Health Care Services—Major Key to Good Health

HEALTH PLANNING may start with health services, but if it does not ultimately emphasize a good environment, our efforts will have been for nothing. Comprehensive Health Planning has its advocates among some physicians, while others express concern that their participation may simply dignify a step toward socialized medicine. Yet, there is a more subtle danger to the profession. Experience indicates that too great an emphasis is being placed upon health care services as a method of providing and improving "good health," to the neglect of genetic, behavioral, nutritional and other environmental factors. Henrik L. Blum, MD, has brought this problem into focus:



* Direction of arrow indicates direction of impact, while width of arrow indicates relative weight or importance of the inputs to health, and to another.

My concern is that physicians individually and medical societies collectively will accept the challenge of health planning, believing that a greater input of personal health care services will solve "health deficits" wherever they exist. It should be clear from the figure that they constitute only a small portion of the significant inputs to health. Health care services can be multiplied manifold and still leave many health needs unrelieved. As we fall short, hospitals and doctors are going to find themselves once again the targets of the dissatisfied and their political exploiters.

We must emphasize to the community how important good environment is, that it is the major contribution to good health. We should enlarge our roles from that of traditional "healer" and become involved in all aspects of health planning. Our future problems will be increased if we ignore air and water contamination, noise levels, crowding, and other noxious by-products of our affluence. Many of these problems can be solved only by socio-economic efforts at their cultural, educational, and financial roots.

Colvin H. Agnew, MD, Chairman,
South-Central Montana Area-Wide
Health Planning Council, Inc.

The Physician As Ecologist

As we enter a new decade, we are told by responsible scientists that, at present rates of expansion, consumption and pollution, mankind may have only about 35 years of life left on earth. The shocking realization of the '70's is that, far from being the privileged favorite of the Creator, with holy license to exploit the treasures of earth for his benefit, man is as subject to the inflexible laws of nature as any lemming or titmouse. Science and technology have developed for Western man a standard of living beyond the wildest imaginings of even 100 years ago—but many now feel that the affluence of Western civilization may already have peaked. The price is about to be extracted for centuries of heedless stripping of the forests, plundering of the earth and fouling of the air and water. We now see, as John Donne said four centuries ago, "No man is an Iland.[*sic*]" All is inter-related and everything we do has subtle effects on everything else. To deal with these problems, the infant science of Ecology, concerned with the relationships of living things to each other and to their environment, was established.

Critical ecologists are coming to believe that the common denominator of man's present and future troubles may well be the human population explosion. It is equally clear that we must deal with overpopulation ourselves, on our own terms and quickly, or nature will do it for us, using the ancient means of war, famine and pestilence, and the more modern, but scarcely less effective method of slow and subtle, mental and physical strangulation on our own effluvia. In a world which cannot feed its present hordes, does anyone seriously believe that an additional billion mouths—forecast by 1980—can be fed? Even in North America, where production of food still outstrips consumption, continued population growth means even more trees cut to build homes, more farmland subdivided or paved with asphalt, more automobiles, more pressure on finite supplies of fossil fuels to supply energy, more minerals mined, less open space. We Americans can indeed continue our population boom, at least for awhile longer, but the rest of the world will not stand by and starve while we eat meat. Our exhortations to foreign governments to control populations will be ineffective so long as we do not control our own. At the very least, we will have to accept a lower standard of living and a "quality of life" much different from what we have enjoyed before. To my mind, the good life does not include living with faceless millions in vast cities and subsisting on plankton and deodorized fish meal (assuming that we have not irreversibly poisoned the oceans.)

If every American family would have two children or less, our population would stabilize and eventually decline toward a more reasonable level. There are many factors

which tend to work against large families, among which are the expense of raising and educating children and the adverse effects of crowding. But man's instinctive urge to procreate and the democratic idea that he should be free to do so will die hard. Even the family planners emphasize planned and wanted children rather than smaller families. These attitudes are rapidly becoming a luxury that we can no longer afford. Subtle and not-so-subtle pressures will have to be exerted against those irresponsible individuals who want to breed without limit, and others must at least have easier access to birth control information. Existing methods of birth control must be widely and cheaply available and efforts made to develop safer and more effective methods. Abortions should be made more easily obtainable and compulsory sterilization should be a prerequisite for obtaining public welfare, in some instances. Senator Packwood, of Oregon, has recently introduced a bill to provide, after January, 1973, a tax exemption of $1,000 for the first child, $750 for the second, $500 for the third, and nothing thereafter. It will be interesting to see how this fares in Congress, but it is at least a step in the right direction. Single individuals and childless couples should also be given tax advantages and taxes for education should be laid more in proportion to the number of children in a family rather than solely on property owned.

Proposals such as the foregoing, which would be greeted with horror a few years ago, are meeting with more and more interest, even favor. Physicians who, as scientists, are familiar with the effects of unrestrained reproduction and overcrowding on other animal species, cannot but apply the same laws to man. Enjoyment of life and good health in the future will depend directly on the application of ecological principles to human beings.

The most difficult hurdle will come, however, when we stop dealing with generalities and realize the need for personal action. It is easy enough to blame greedy industrialists for pollution, and starving millions in Asia or Latin America for overpopulation. The future, however, will truly depend on what each one of us is willing to sacrifice. What about it?

Warren D. Bowman, Jr., MD
Montana Scientific Editor

JANE NUGENT COCHEMS COMPETITION

The University of Colorado School of Medicine announces the Ninth Annual Cochems Competition, funds for which were provided in the will of the late Mrs. Jane Nugent Cochems. A prize of $2,500 will be awarded to the author of the best paper in the field of "Thrombophlebitis and Basic Vascular Problems." Basic vascular problems under consideration in this instance should be concerned with the underlying mechanisms or processes of vascular disease, particularly those associated with thrombosis, but not necessarily restricted to it.

The competition is open to all persons holding the doctorate degree and entries must be received in triplicate, including all charts, illustrations and photographs, on or before November 16, 1970. For income tax reasons, eligibility is limited to those physicians who are subject to U. S. income tax regulations. Papers submitted in the competition may not be published until after the winner has been announced early in 1971.

Inquiries regarding the competition and all manuscripts should be submitted to Dr. David W. Talmage, Dean, School of Medicine, University of Colorado Medical Center, 4200 E. Ninth Avenue, Denver, Colorado 80220.

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Serious seat belt injuries*

William T. Gill, MD, Helena, Montana

Automobile seat belts may produce a characteristic type of injury which can be prevented by the additional use of a shoulder harness.

High speed and inertia have combined as the etiologic agents in trauma now known as "seat belt injuries." These injuries occur in only a small per cent of automobile passengers wearing lap-type seat belts but may be of serious import. These injuries have a characteristic pattern and, unless the surgeon is aware of their insidious nature[5], carry a high morbidity and mortality.

On June 21, 1968, four members of the Montana National Guard were returning from maneuvers at Deer Lodge, Montana, to the Natonal Guard Camp at Fort Harrison, Montana. They were in the private automobile of one of the men. The driver and front seat passenger wore seat belts and shoulder harnesses. The rear seat passengers wore lap-type seat belts properly placed and tightened. The automobile was descending from McDonald pass on the east side of the continental divide at a speed estimated to be between 60 and 75 miles per hour. The driver entered a fairly sharp turn, admittedly at an excessive rate of speed, and suddenly noticed that he was bearing down on a car drawing a trailer. To avoid a collision, he applied his brakes, and turned into a ditch at the right side of the road. The automobile came to a sudden stop with its front end driven into the far side of the ditch, approximately 20 feet from the edge of the road.

All of the occupants were thrown against their restraining devices. The front seat occupants suffered a few minor abrasions and contusions, but were able to return to active duty the following morning. The two rear seat passengers remained in the vehicle, but sustained serious injuries which are reported. They were transported to the Fort Harrison Veterans Administration Center Hospital by ambulance.

CASE REPORTS

G. A. R., a 24-year-old white male, had been in the left rear seat. On arrival at the hospital, he complained of diffuse abdominal pain, low back pain, and was vomiting small amounts of stomach contents at intervals. Blood pressure was not obtainable, and heart rate was 140. A severe contusion was present across the suprapubic region with the ecchymosis extending into both flanks. The abdomen was rigid on the left side, soft on the right, diffusely tender, with exquisite rebound tenderness, and was silent. Intravenous fluids and a 500 ml. dextran infusion resulted in a return of blood pressure to 90 systolic. A chest and abdominal film revealed no abnormality. Ten units of blood were ordered, and the patient was taken to the operating room for immediate exploration with a tentative diagnosis of severe intra-abdominal hemorrhage and probable ruptured viscus.

The abdomen was opened through a midline incision from the xiphoid process to the symphysis pubis. This revealed a complete transection of the right rectus abdominis muscle in its lower third. The divided deep epigastric vessels were ligated.

When the peritoneum was opened, blood overflowed the abdominal wall. After aspiration the source of bleeding could be identified as coming from numerous vessels in the mesentery of the

*From the surgical service, Veterans Administration Center Hospital, Fort Harrison, Montana. Presented at the annual meeting of the Montana—Wyoming Chapter of the American College of Surgeons, East Glacier, Montana, August 1, 1969.

ileum from which 56 inches of bowel had been avulsed, giving the same appearance as one sees when the bowel is cut away from the mesentery for examination at autopsy. The vigorously bleeding vessels were clamped and ligated, following which, with blood replacement going on, the peritoneal cavity was carefully explored. In addition to being avulsed this segment of bowel had been transected in four places. The vermiform appendix had been avulsed from its mesentery, and torn from its attachment to the cecum. The seomuscular layer had been torn from the proximal third of the sigmoid colon, and the adjacent mesentery had been avulsed from this segment of the colon. The disrupted vessels were bleeding freely. Exploration revealed no other injury.

The avulsed ileum was resected and end to end anastomosis performed about 10 cm. from the ileocecal valve. The cecum was closed where the appendix had been torn off. The sigmoid was divided at the proximal end of the damaged portion and brought out through a stab wound as a colostomy; the distal end was brought out as a mucous fistula. Drains were placed in the right gutter and pelvis, and brought out through stab wounds. The divided right rectus muscle and contused rectus sheath were debrided and closed. The abdomen was closed. During the course of operation, and immediately thereafter the patient received 10 units of blood. Eight hours postoperatively the hematocrit was 31 per cent and the hemoglobin 11.6 grams per 100 ml. Two additional units of blood were given.

On the sixth postoperative day, when allowed to stand at his bedside, the patient complained of low back pain. X-ray films then revealed a severe comminuted fracture of the body of L_3 with avulsion of the laminae and spine. Orthopedic and neurosurgical consultants recommended only bed rest on a bedboard in the absence of evidence of cord damage.

On the 20th postoperative day a right lower abdominal quadrant abscess was evident, and was drained.

On the 26th postoperative day profuse bleeding from the colostomy developed and continued for 14 hours. This was attributed to a stress ulcer, and responded to strict ulcer management with replacement of blood loss with five units of whole blood.

On the 50th postoperative day fever to 104°, left chest pain, and cough developed. A chest film revealed a pneumonic infiltrate involving both lobes of the left lung. This responded to antibiotics and the temperature was normal after three days.

Three months after injury the continuity of the sigmoid colon was re-established. It was interesting to observe at this time that the proximal end of the distal segment from which the seromuscular layer had been avulsed over a distance of 15 cm. together with the adjacent mesentery, was completely viable. However, this denuded segment was resected at the time of closing the colostomy.

A Taylor brace was fitted, and the patient started ambulation with the use of a cane. He was discharged from the hospital on October 10, 1968. He has been examined at regular intervals since. The fracture of the body of L_3 healed, and no evidence of the avulsed laminae and spine remains. He was totally asymptomatic one year after injury, and was released to engage in any type of work he chose.

M. T. G., 24 years of age, was the passenger in the right rear seat with his lap-type seat belt properly in place at the time of the accident. He was admitted to the hospital at the same time as G.A.R. He, too, had a contusion across his lower abdomen from being thrown against his seat belt, and complained of moderate lower abdominal and low back pain. Examined three times at intervals of about two hours, moderate tenderness to deep palpation was present across the lower third of the abdomen, but there was no muscle rigidity or rebound tenderness, and normal peristalsis was present. There was greater tenderness in the right flank and in the paraspinal muscles than there was in the abdomen. He was last examined about midnight, and further observation was decided upon. The following morning the same examiner felt that the lower abdominal tenderness had increased, and definite rebound tenderness had developed. Peristalsis was less vigorous than it had been eight hours previously. Exploration was advised, and the patient accepted the advice, although somewhat reluctantly.

The abdomen was opened through a generous midline incision. There was a severe hematoma involving the lower third of both rectus muscles, but neither was completely divided. The peritoneal cavity contained about 500 ml. of bloody fluid, but no active bleeding could be detected. Twelve inches of the proximal ileum had been avulsed from its mesentery, and was necrotic. A six inch segment of sigmoid colon had been avulsed from the mesosigmoid, and was denuded of its seromuscular layer. The remainder of the sigmoid mesentery was severely contused and contained a hematoma. The necrotic segment of ileum was resected, and an end to end anastomosis performed. The denuded and avulsed segment of sigmoid colon was resected and the proximal end brought out in the left lower quadrant as a colostomy with the distal end fixed in the lower end of the incision as a mucous fistula. The patient's postoperative course was uneventful; the colostomy functioned well.

He continued to complain of low back pain, but x-ray films were interpreted as being normal. However, because of the continued complaint of back pain, a second series of films, six weeks after injury, revealed a fracture of the left transverse process of L_3, narrowing of the L_{3-4} interspace, and

minimal compression of the body of L_4. At this time the pain was subsiding and no specific treatment was instituted. On August 20, 1968, continuity of the sigmoid colon was re-established. Following closure of the colostomy, he had an uncomplicated convalescence and was discharged as cured on September 5, 1968. He has not been examined since then.

Discussion

These two cases illustrate the gamut of serious intra-abdominal and spine injury related to the wearing of lap-type seat belts. Each facet of these injuries has been reported in the literature.[12]. In February, 1968 a review of the American literature documented 13 similar cases with 12 surviving, suggesting that serious intra-abdominal seat belt injury to the viscera is relatively rare.[13]

Body restraining devices, seat belts and shoulder harnesses, were probably first used in aircraft. As research was started to promote aircraft and automobile safety, the value of restraining devices became apparent. They were uniformly used in aircraft to prevent the aviator from falling off his precarious perch out in front of his pusher-type power plant, and, later, to prevent the pilot from falling out of the plane when jostled about by air currents, and during acrobatic maneuvers. I have not been able to ascertain when they were first used in automobiles, but early experimental evidence proved that an automobile occupant was less likely to be seriously injured if he was not thrown out of the vehicle in an accident. During World War II, military vehicles were equipped with lap-type seat belts, but they were used principally to keep the occupants from falling out while traveling over rough terrain. After World War II seat belts could be obtained for civilian vehicles on special order, and quite a few of my medical confreres equipped their automobiles with them. A study by the A.M.A. in 1961 showed that 33 per cent of the physicians questioned were using seat belts in their automobiles.[2]

In 1961, an analysis of 944 injuries in which seat belts were worn concluded that a seat belt as the etiologic agent of injury was very rare.[2] By 1965, seat belts were considered an important factor in determining the type of injury resulting from sudden deceleration, and the reality of a "seat belt syndrome" was acknowledged.[9] Simply classified, seat belt injuries may be considered as those involving the abdominal wall, intra-abdominal injuries, and skeletal injury.

Abdominal wall injury is usually manifested by the signs of contusion and hematoma formation. An accident victim exhibiting a severe contusion of the abdominal wall should be carefully observed for intra-abdominal injury. In fact, a severe contusion of the abdominal wall by a seat belt has been said to be an indication for exploration of the peritoneal cavity.[9] The most severe abdominal wall injury described is transection of one or both rectus muscles.[12]

All types of intra-abdominal injury have been reported in the literature. Among these are incomplete intestinal obstruction due to an adhesion which apparently developed following a contusion of the wall of the ileum,[1] rupture of the aorta,[2,14] rupture of the liver, spleen, renal artery, the pancreas, and duodenum,[2,3] intestinal perforation,[5,6,12] perforation of the sigmoid colon,[6] rupture of the pregnant uterus,[11] seromuscular tear of the intestine,[9,12] and transection of the stomach.[13]

Injuries of the skeletal system include pelvic fractures,[2,12] fracture and fracture dislocation of the hip,[2] and fracture of the lumbar spine, both compression and fulcrum types, with and without damage to the spinal cord.[2,12] The fulcrum type of fracture of a lumbar vertebra is characteristic of seat belt injury. In this type of fracture the vertebral body is fractured transversely with fracture of the pedicles, and severe displacement of the laminae and spine. It has been described as a "splitting apart" type of fracture,[8] and was well demonstrated in the case of G.A.R.

HOSPITAL
LIFE
DISABILITY
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GROWING
WITH THE
ELEVEN
WESTERN STATES

I have been unable to find reports of experimental evidence to explain completely the mechanism of seat belt injuries, although in many instances it seems quite obvious that the snubbing effect of the belt causes the injury. With lap-type seat belts alone, the upper part of the body and head are not restrained and extensive head, face, and thoracic injuries are frequent. Spleen injuries are prone to occur where the seat belt is worn across the upper abdomen,[3] or where a diagonal belt across the thorax is combined with a lap-type belt,[7] which also predisposes to rib fractures, and fracture of the sternum.[7]

Williams and Sargent of the department of surgery at Ohio State University reported on some interesting animal experiments, and postulated that intestinal injury results from a shearing of the intestine between the seat belt compressed area of the abdominal wall and the spine.[4] Using anesthetized dogs, in a supine position with a board across the abdomen, they dropped a 50-pound weight a distance of eight feet onto the board. They found that there was a marked instantaneous rise in intraluminal pressure, and a greater instantaneous rise in intraperitoneal pressure, but the only part of the intestine injured was that which lay across the spine, and a tearing at fixed points such as the ligament of Treitz and at the ileocecal valve. When they prevented the board from compressing the intestine between the abdominal wall and spine, by arresting its descent against steel bars, the intestine was not injured. This was true whether the intestine was collapsed or filled with fluid.[4] They predicted that most seat belt injuries would affect the ileum and proximal jejunum, since the former was more likely to be across the spine and the latter was fixed at the ligament of Treitz. To date, not enough reports have appeared in the literature to test their theory.

More recently, since avulsion of the bowel from its mesentery has been seen, it has been theorized that the inertia of the fluid filled bowel literally tears it away from the mesentery. This is pure theory, and no experimental evidence has been obtained to support it.[10]

There would be little reason for reporting these cases if they did not illustrate a type of injury characteristically produced by a seat belt when sudden deceleration of the vehicle occurs. The literature contains many case reports indicating how the insideous onset of symptoms has resulted in dangerous delay in treatment. If hemorrhage is mild or stops spontaneously, the development of intestinal necrosis may progress quite slowly. In the case of M.T.G. his abdominal findings were far from alarming. If it had not been for the findings in the first case, exploration in the second case might well have been further delayed, yet, when he was operated upon, 12 inches of frankly gangrenous bowel was encountered.

Published case reports illustrate delay in treatment of 3 to 13 days after injury. Following a head-on collision, a patient developed nausea, vomiting, and signs of toxicity; on the sixth post-injury day a chest x-ray showed air beneath the diaphragm which led to exploration and finding a perforated jejunum with generalized peritonitis and a pelvic abscess.[5] In another case four days elapsed before operation, with slowly developing signs of peritoneal irritation produced by a 2 cm. blowout on the mesenteric border of the upper jejunum.[6] Transection of the proximal ileum existed nine days before operation in one case, and 13 days in another.[9] The same authors reported a third case from a military hospital in which avulsion of a large segment of small intestine and a segment of sigmoid colon resulted in death from hemorrhage within an hour of the patient's admission to the hospital.[9] Another patient, who had two complete transections of the jejunum and avulsion of the transverse mesocolon from its posterior attachments, was not explored until eight days after injury.[10] All of these instances are reported from hospitals staffed by qualified surgeons.

As might be expected, wound infection is the most frequent complication.[6,9,10,12] Next in frequency is subphrenic abscess.[7,9] Other complications have been frequent, and none of them is particularly related to the seat belt itself. These include postoperative atelectasis,[7] adhesions requiring lysis, pulmonary embolism, pleuroperitoneal fistula, bronchopneumonia,[12] and deep vein thrombophlebitis.[13] Serious hemorrhage from a stress

ulcer has only recently been reported as a postoperative complication of a sudden deceleration injury.[14]

Many authors have expressed the opinion that the serious intra-abdominal and skeletal injuries, such as here reported, might be avoided if the restraining device included a shoulder harness. This opinion is well supported by the facts in this case, where the driver and front seat passengers, restrained by both lap-type seat belts and a shoulder harness, received only insignificant injuries, and the rear seat passengers, wearing only lap-type seat belts, were very seriously injured. A more perfectly controlled experiment could not be devised. But, even with the possibility of a seat belt injury, it has been estimated that 60 per cent of the persons so injured would have been killed if they had not been restrained by a lap-type seat belt.[10]

Summary

The two cases of serious intra-abdominal and skeletal injury, peculiar to abrupt deceleration of an automobile when the occupants are restrained by a lap-type seat belt alone, are reported. Two other occupants of the vehicle, in the same accident, but restrained by both lap-type seat belts and shoulder harnesses, sustained only minor and insignificant injury. •

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Carotid body tumor

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Case Report and discussion of the surgical treatment

CARTOID BODY TUMORS are rare. In 1964 Wilson[13] estimated that about 500 cases had been reported. As with some other unusual conditions, opinions vary regarding the natural history and the proper form of treatment for these lesions. It is for this reason that the following case report and brief review of the literature seemed worthwhile.

CASE REPORT

A 74-year-old white lady was admitted to Saint Vincent's Hospital, Billings, Montana, for investigation of an enlarging, painful and tender mass in the left upper neck. This mass had been first noted about 1½ years before and recently had been painful enough to cause the patient to have difficulty sleeping.

Significant physical findings were limited to the left side of the neck where there was a 3.0 centimeter, slightly tender mass overlying the carotoid bifurcation. There was transmitted pulsation but no bruit. Routine blood and urine studies were unremarkable. Blood urea nitrogen and prothrombin time were normal. A chest x-ray showed no abnormalities, and the electrocardiogram was interpreted as showing left axis deviation.

Percutaneous carotid angiography via a femoral artery demonstrated lateral displacement of the left internal carotid artery and widening of the bifurcation of the common carotid artery (Fig. 1). Later films revealed significant vascularity of a mass at the bifurcation (Fig. 2).

Fig. 1. Carotid arteriogram showing lateral displacement of the left internal carotid and widening of the bifurcation of the common carotid artery.

Fig. 2. Carotid arteriogram. Late film showing vascular mass at the carotid bifurcation.

A diagnosis of carotid body tumor was made and surgical treatment advised. The tumor was exposed through an incision along the anterior border of the left sternocleidomastoid muscle. This muscle with the internal jugular vein was retracted posteriorly. A few lymph nodes in the region of the carotid bifurcation were removed and found to be histologically normal. There was a 2.5 to 3.0 centimeter, red-brown, lobulated mass at the carotid bifurcation and between the external and internal carotid arteries (Fig. 3). These vessels were dissected distal to the tumor and encircled with tapes. A tape was passed around the common carotid artery proximal to the tumor. The superior thyroid artery was divided in order to facilitate mobilization of the tumor. The hypoglossal nerve was in intimate association with the upper portion of the mass. The vagus nerve was identified posterolaterally. Complete resection of the carotid body tumor was then suprisingly simple in view of the vascular nature of the tumor. Only a few vessels from the carotid bifurcation required suture ligature, and the aforenoted nerves and the carotid vessels were not injured (Fig. 4). The postoperative course in the hospital was uncomplicated, and there were no detectable cerebrovascular, hypoglossal or vagus nerve deficits at the time of dismissal on the 7th day.

Pathology: The resected tumor measured 10x19x27 millimeters and histologically was composed of uniform, deeply staining cells separated by narrow bands of highly vascular connective tissue (Fig. 5).

Fig. 3. Photograph made at operation of the exposed carotid body tumor. Tapes encircle the common, external and internal carotid arteries. The latter is at the right. The forceps at the left are on the superior thyroid artery. The hypoglossal nerve is visible in the upper portion of the photograph.

Discussion:

Most reported cases of carotid body tumor presented with a mass at the region of the carotid bifurcation and symptoms due to encroachment on contiguous structures such as the vagus, hypoglossal, and glossopharyngeal nerves. The tumor may be very large and extend into the floor of the mouth and to the base of the skull. Pain in the neck and ear, tenderness, dysphagia, hoarseness and carotid sinus syndrome are the most common symptoms.

Recently several authors[3,7,13] have emphasized the value of angiography in the diagnosis of carotid body tumors. The pathognomonic findings include lateral displacement of the internal carotid artery, widening

Fig. 4. Photograph showing the resected carotid body tumor. Note widening of the carotid bifurcation and lateral displacement of the internal carotid artery (on right of photograph).

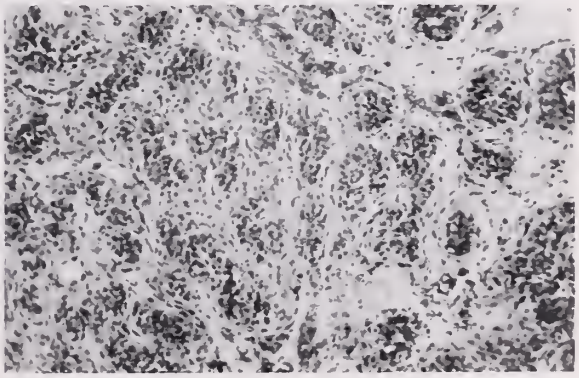

Fig. 5. Photomicrograph of a section of the carotid body tumor showing uniform, dark cells and narrow bands of vascular stroma.

of the bifurcation of the common carotid and demonstrable vascularity of the tumor on delayed films.

The treatment of carotid body tumors has evolved through many stages. Harrington, Clagett and Dockerty,[6] in 1940, reported that 50 per cent of these lesions showed histologic evidence of malignancy. Although it was recognized that metastases were unusual, they favored complete resection. For about a decade this was the accepted treatment. In 1950 Monro[9] reviewed 223 reported cases in which there was a high incidence of hemorrhage and cerebral ischemia contributing to a mortality of 29 per cent. Lahey and Warren,[8] among others, at this time advised against complete removal of carotid body tumors unless resection could be accomplished without jeopardizing cerebral circulation.

Although usually considered to be benign tumors, distant metastases have been recorded in about 5 per cent and local recurrence in about 12 per cent of reported cases.[4,10,11,13] Conley,[2] as late as 1963, stated that carotid body tumors should not be resected in patients over 50 years of age because of the slow growth of these lesions and the high incidence of hemiplegia and significant mortality associated with resection. Recently, however, the consensus[1,3,7,11,12,13] appears to be that most carotid body tumors are safely resectable with the availability of special technics of blood vessel surgery such as internal shunts and grafts. In addition, the technic of resecting these tumors in the subadventitial plane as first advocated by Gordon-Taylor[5] and later emphasized by other writers[3,10,13] has been of considerable help in some cases.

Summary:

The case of a small carotid body tumor successfully resected has been reported. Review of current literature indicates that at the present time, with modern vascular surgical technics, most carotid body tumors are resectable without excessive mortality and with preservation of the cartoid vessels.•

ACKNOWLEDGMENT

The carotid arteriograms in this case were made by Jon A. Anderson, MD, Department of Radiology, Saint Vincent's Hospital, Billings, Montana.

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Fat embolism with unilateral involvement of the lungs*

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A case of unilateral pulmonary fat embolism is presented. The collapsed left lung was protected from the effects of fat embolism by a fortuitous pneumohemothorax.

Fat embolism following trauma, particularly fracture of the femur, is a common event, although it is unrecognized unless accompanied by obvious clinical signs.[1] This case presented many of the typical findings of pulmonary and systemic fat embolism. The pulmonary form is characterized by fever, rising pulse rate, dyspnea, precordial pain, cough and sometimes frothy sputum. Diffuse clouding of both lung fields is considered to be a characteristic finding on x-ray film of the chest.[1] More recent papers have emphasized marked arterial hypoxia without cyanosis or hypercapnia.[2,3,4] Systemic manifestations of fat embolism include delirium, followed by stupor and coma.[1] Recent evidence suggests that hypoxemia plays a considerable role in producing these findings which were previously ascribed entirely to the emboli in the brain. Fat globules gain access to the systemic circulation via arteriovenous shunts in the lung. Petechiae particularly about the axilla and upper chest and in the eye grounds are highly suggestive of systemic fat embolism. Oliguria and anuria are manifestations of renal embolism and shock. Fat may be demonstrated in the urine. Serum lipase may be elevated.[1]

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Pathogenesis of the disease may involve more than mechanical obstruction of small vessels by fat released into the circulation at the site of injury. Tedeschi et al have emphasized the possible role of shock, alteration in coagulation factors, impairment in blood flow and production of fat emboli from destabilized blood lipids.[1] Peltier has been an exponent of the importance of the locally toxic effect of fatty acids hydrolyzed by lipase from the embolic fat globules.[5]

CASE REPORT

On March 31, 1968, a 30-year-old rancher was injured as his automobile rolled off the highway at approximately 7:00 A.M. He was found two hours later in a dazed condition. On admission to a local hospital, he was in shock; two units of blood were administered. X-rays revealed a hemopneumothorax on the left with associated rib fractures and a fracture of the left tibia. Paracentesis of the abdomen was negative for blood. The patient was transferred to St. Patrick Hospital in Missoula and admitted approximately 15 hours after the accident.

On admission, blood pressure was 120/80, pulse 120 and regular. He was alert and oriented. The lungs were clear but breath sounds were greatly decreased on the left. There was tenderness over the thoracic spine and the left ribs posteriorly. The abdomen was rigid but nontender. Blood-tinged urine was present in the indwelling catheter.

Hematocrit was 39 per cent. X-rays confirmed the presence of fluid in the left hemithorax. The right lung field was clear. Fractures of the 5th to the 10th left ribs posteriorly were identified. Fractures of the 6th and 7th thoracic vertebrae were present which were thought to be ancient. The left tibia was fractured in its middle third.

Seventeen hours after the accident, a 22-French catheter was inserted into the left anterior 2nd interspace and immediately 1,000 cc. of blood and an unknown amount of air were evacuated. Three

Fig. 1. Initial chest x-ray showing hemopneumothorax and rib fractures on left.

units of blood were administered. Procaine penicillin, 1.2 million units, and Streptomycin, .5 gm. were given intramuscularly and this treatment was continued every twelve hours for a total of seven days.

The day following the accident (April 1), blood pressure remained stable at 150/70, pulse 120, respirations 20 per minute, temperature 100 degrees Fahrenheit. An additional 500 cc. of bloody fluid had drained from the chest tube. Urine output in the first 16 hours after admission was 550 cc. Chest x-ray revealed a small amount of pleural effusion on the left. There were no significant pulmonary infiltrations. Urinalysis revealed a 2+ albuminuria, 15-20 white blood cells and 50-60 red cells per high-powered field.

On April 2, his temperature spiked to 102 degrees, and respirations increased to 30 per minute. Heart tones were normal. The patient was mildly confused. The lungs were clear to auscultation. Central venous pressure was 13 cm. of water. Petechiae of the upper chest, particularly in the right pectoral area, were first noted. There was a 16 mm./Hg. difference in systolic blood pressure with inspiration and expiration. Electrocardiogram was normal. Urine examination for fat was negative. The patient was unable to raise sputum for examination. A chest x-ray revealed pleural reaction in the left base but no significant fluid. There was bilateral pulmonary infiltration which appeared to be pulmonary edema. Heart size was unchanged. Nasal oxygen was instituted and the patient was digitalized with 1.0 mg. Lanoxin intravenously and .5 mg. intramuscularly, followed by .25 mg. intramuscularly every 12 hours. Intravenous infusion of 5 per cent ethyl alcohol and 5 per cent glucose in water was begun at the rate of 1,000 cc. every 12 hours.

On April 3 the patient was less confused. Central venous pressure was 8 cm. of water, respiration 40 per minute, pulse 120 per minute and regular, hematocrit 38 per cent, and temperature ranged from 99 to 101 degrees Fahrenheit.

On April 4, respirations had increased to 40-50 per minute, the pulse ranged from 90-110 per minute. The patient was oriented, but drowsy, and slept unless aroused. Lanoxin was decreased to .25 mg. daily. A chest x-ray revealed a marked increase in infiltration in the right lung consistent with the configuration of fate embolism. The left lung was clear except for pleural thickening at the left base. The thoracotomy tube had been removed.

On April 5, respirations remained 40-50 per minute, pulse 84 per minute. The lungs were clear to auscultation. Oral fluids were taken. The patient remained drowsy but was aroused easily. On April 6, respirations were 40 per minute. A few rhonchi were heard in the right lung field. Intravenous alcohol, oxygen and Lanoxin were discontinued. A chest x-ray revealed little change in the infiltration in the right lung, with some clearing at the right base. By April 7, respirations had decreased to 30 per minute, temperature elevations to 101 Fahrenheit were recorded. Clinically, the patient continued to improve.

On April 8, respirations were 20 per minute, pulse 80 and regular, and the maximum temperature was 99.4 degrees Fahrenheit. A chest x-ray revealed marked clearing of the infiltration and

Fig. 2. X-ray of chest on 7th hospital day. Infiltrate in right lung represents probable unilateral fat embolization. Left lung is clear.

Fig. 3. X-ray of chest on 12th hospital day shows resolving infiltrate.

consolidation in the right lung. A lung scan was performed using Albuminotope. There was excellent circulation in the left lung with no areas of poor concentration. There were multiple areas of poor circulation in the right lung.

On April 9, the tibial fracture was reduced and a cast applied. The lung fields remained clear to auscultation. The patient had no further complications and was discharged on April 11, ten days after the accident.

Discussion

The fascinating facet of this case is the predominant unilateral involvement of the lungs, at least by x-ray criteria. With a less than extensive review of the literature, I am unaware of a similar case report. The diagnosis was suggested initially with tongue-in-cheek. The sequence of events proved that unilateral involvement of the lungs was most logical. The left lung was partially collapsed by hemopneumothorax for 17 hours after the injury. Numerous clinical and experimental studies have demonstrated a markedly reduced blood flow in an unexpanded lung.[6] Therefore, the left lung was exposed to less fat-laden blood. It must be concluded that the embolic phenomena occurred within a few hours after the accident and that deposition of circulating lipids following re-expansion of the left lung was not a significant factor here, as some have suggested. Whether this man would have experienced greater respiratory insufficiency had both lungs been involved, I cannot say. Pulmonary involvement can be a fatal complication of fat embolism as demonstrated by another case we have seen.

Treatment of fat embolism is controversial. The use of oxygen and assisted respiration is of unquestioned value and the only really proven effective treatment.[2,3,4] Therapy which has been proposed includes ethanol, Heparin, steroids and Dextran. Ethanol is used for its inhibition of lipolysis by lipase so as to prevent the toxic effect of fatty acids on pulmonary tissue. Also Ethanol is an effective fat solvent in vivo. Heparin, conversely, has been used because of its lipolytic activity and also for its lipemia-clearing effect. Steroids have been given to counteract the inflammatory activity of the released fatty acids.[5] Dextran has been suggested to improve blood flow characteristics. •

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Rupture of the uterus

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A brief review of its causes, recognition, treatment, with illustrative case reports.

THE UNIQUE LOCATION and structure of the pregnant uterus render it remarkably resistent to external force and it retains its treasured cargo surprisingly well even under the most adverse circumstances. In most injuries, survival of the mother is accompanied by survival of the fetus. Two factors account for this: the early pregnant uterus is surrounded by the bony pelvis and supporting soft tissue, while the later pregnant uterus is filled with enough amniotic fluid to protect the fetus. Injury to the pregnant uterus does occur, but is quite unusual and reports in the literature are scarce. Dr. Carl Javert of Women's Hospital, New York City, is an extensive study of 251,000 previable pregnancies, found only 17 abortions as a result of external trauma. My own personal experience over the last 19 years reveal no uterus ruptured by external force, although in two patients such force caused premature separation of the placenta with delivery of a stillborn infant within 36 hours. In one case the patient, 36 weeks pregnant, fell on her abdomen while running, and in the second case an auto accident caused the woman to be thrust violently against the automobile dashboard.

Even in this era of sophisticated methods for dealing with shock, with excellent anesthesia, antibiotics, etc., uterine rupture is a catastrophic complication of pregnancy, which confuses and frightens the obstetrician. Its very rarity makes its unexpected occurrence potentially more dangerous. It accounts for about 5 per cent of all maternal deaths in the United States. There is a great variability in incidence reported in the literature over the past 20 years, varying from 1 in 93 deliveries to 1 in 3,029 deliveries, with a median incidence of 1 in 1,300. There appears to be a 2 to 3 fold increase in incidence over the last 15 years.

Increasing parity and particularly grand multiparity are major factors in uterine rupture. However, even in the patient of low gravidity, the obstetrician should not be lulled into a false sense of security when factors predisposing to uterine rupture are present. There are several classifications of uterine rupture, but the most useful one is the following:

1. Rupture occurring in the intact uterus.
   a. Traumatic b. Spontaneous
2. Rupture occurring in the scarred uterus.

Patients with previous myomectomy or Cesarean Section would be included in the scarred group, whereas rupture secondary to obstetrical procedures would be placed in the induced or traumatic group. So-called silent ruptures discovered only at the time of elective repeat Cesarean section should be considered in a separate category because of the almost uniformily good results obtained for both mother and infant. These

silent ruptures are of no influence in the decision to operate, and do not complicate the operative procedure. They are distinguished from true rupture by lack of shock and hemorrhage, absence of a preoperative diagnosis of rupture, and no fetal or maternal mortality. This type of rupture should be considered separately in the evaluation of this problem.

The great majority of patients, more than 80 per cent, are at the 38th week of pregnancy or later at the time of rupture. Spontaneous and traumatic ruptures tend to occur at about term, or 40 weeks, while ruptures of the scarred uterus occur somewhat earlier, usually at about 38 weeks.

In the scarred uterus group, we are dealing mainly with patients who have had a previous Cesarean section. There seems to be little doubt that there is a greater tendency for the classical scar to rupture than the transverse, lower segment scar, in a ratio of about 2 to 1. The classical scar also has a greater tendency to rupture prior to the onset of labor, whereas the low segment, transverse scar has about an equal incidence of rupture prior to or during labor. It is pertinent at this point to spend a moment discussing the dictum "Once a Cesarean section, always a Cesarean section." This previously inviolate rule has been broken many times in recent years. There are several points of consideration when one is confronted with this situation. First, for what reason was the original Cesarean section performed? Obviously, one is not going to attempt a vaginal delivery in a patient previously operated on because of relative cephalopelvic dysproportion. Second, what was the type of section done? Prudence and statistical analysis indicate that the dictim should be followed if one is dealing with a patient who has had more than one previous section, and/or if the previous section was of classical or low vertical type. Either of these two conditions should cause one to elect a repeat Cesarean section. On the other hand, the patient with one previous low transverse section can be considered for a trial of labor and possible vaginal delivery, and statistically one could expect to deliver vaginally safely 50-60 per cent of these women. In the remaining 40-50 per cent, there will be some uteri sacrificed because of rupture, and some related perinatal mortality. This is the price that has to be paid if one is to avoid a substantial number of elective repeat Cesarean sections. Why should one be concerned about this? Simply because it is a fact that there is an inherent maternal mortality rate of about 1.2 per thousand deliveries, and a similar fetal perinatal mortality rate associated with elective section. When a patient of mine suggests and sometimes demands a Cesarean section, my answer is that if Cesarean section were the safest way to deliver babies for both mother and baby, we'd deliver them all that way.

Traumatic rupture of the intact uterus is brought about by the following: Oxytocin induction or augmentation of labor, breech extraction, internal version and extraction, forceps delivery and manual removal of an abnormally attached placenta. From a statistical standpoint, there is no question that patients with 5 or more pregnancies are hazardous subjects in which to induce or augment labor with Pitocin. The dangers of total breech extraction or internal podalic version and extraction even in the most skilled hands is legendary, many of these obstetric manipulations being replaced in recent years by Cesarean section. Likewise, unskilled forceps application, especially midforceps, can result easily in traumatic laceration of the lower uterine segment.

The diagnosis of uterine rupture is first of all made by awareness of the condition. The classical signs are cessation of labor, regression of the presenting part, alteration of uterine contour, vaginal bleeding, and shock. Manual exploration of the uterine cavity will almost always be diagnostic, and should be performed when one is confronted with the foregoing manifestations, or the following conditions: Any difficult vaginal delivery, breech extraction, internal version and extraction, vaginal delivery following previous Cesarean section, extensive laceration of the cervix, abnormal presentation, polyhydramnios or multiple pregnancy with overdistension of the uterus. An additional simple diagnostic procedure frequently overlooked is cul-de-sac needle puncture.

Maternal mortality has decreased markedly over the last 25 years, probably because of early diagnosis, availability of blood, good anesthesia, antibiotics, and substitution of Cesarean section for traumatic obstetric procedures. Almost all of maternal deaths associated with uterine rupture follow obstetric trauma or spontaneous rupture; very few deaths result from rupture of the scar of a previous section, which is usually asymptomatic and recognized only at the time of an elective repeat section. Parinatal mortality, unfortunately, has not followed the downward trend to the same degree as maternal mortality. Most reported series in recent years show a fetal mortality rate of 30-60 per cent.

The essence of treatment in this condition is the following: 1. Early recognition, 2. Medical treatment of hemorrhagic shock, 3. Total abdominal hysterectomy. Some ruptures will lend themselves to surgical repair, but this should rarely be done, and probably only in a young patient.

REPORT OF CASES

Case 1. A 36-year-old white female, gravida 8, para 6, ab 1 had her last pregnancy one year prior to this present pregnancy — largest infant 9 lbs.; smallest 5 lbs., 4 oz. Previous labors other than as a gravida 1 averaged from 5 hours to 1 hour in duration; there was no previous abdominal surgery; patient was 41 weeks of gestation. She came into the hospital with irregular contractions and questionably ruptured membranes. She was in the hospital for 16 hours without any evidence of labor. X-ray examination revealed vertex unengaged. Because she lived 50 miles from the hospital and was 1 week overdue, intravenous Pitocin drip was started, with 1cc of Pitocin in 1000 cc of 5 per cent glucose in water. Twenty-five minutes later with the drip running 12 drops per minute, the patient complained of severe bearing-down pain. Ten minutes later, a large amount of bloody discharge appeared at the vagina and the fetal heart tones became inaudible. At laparatomy, a ruptured uterus was found, the laceration extending from the lower left lateral fundus across to the lower right uterine segment. The fetus was in the abdomen, and dead. The placenta was separated from its attachment in the upper, posterior portion of the fundus, and was found in the lower uterine segment. Total abdominal hysterectomy was performed.

Case 2. A 21-year-old female, gravida 3, para 2, was $38\frac{1}{2}$ weeks pregnant by dates. She had had two previous Cesarean sections because of cephalopelvic dysproportion. Spontaneous onset of labor occurred two hours prior to section. At operation, the superior half of the classical scar was ruptured, through which the membranes were prolapsed and the infant visible. There was delivery of a living infant, which survived. Total abdominal hysterectomy was performed. This patient lived 130 miles away, where she had received her prenatal care and where she was scheduled to have an elective section two days later.

Case 3. A 33-year-old white female, gravida 5, para 4, twins, had had four previous sections, including one classical, one verticle low segment and one transverse low segment. Initial section was done because of inertia with the first pregnancy. Infants varied between 6 lbs., 8 oz. and 8 lbs., 6 oz. She was admitted for repeat Cesarean section at 39 weeks. At time of section, a circular defect in the uterus at the junction of the lower uterine segment and the contractile portion of the uterus approximately 3 inches in diameter was found, through which the membrances were protruding and the infant could be seen. A viable infant was delivered and a total abdominal hysterectomy was performed.

Case 4. A 27-year-old gravida 4, para 3, had her last two deliveries by Cesarean section, type unknown. Original indication was placenta praevia. Elective section at 39 weeks revealed a large defect in the old scar, 10-12 cm. in diameter, through which the membranes were bulging and the infant visible. Total hysterectomy was performed after living, term infant delivered.

Case 5. A 30-year-old gravida 5, was para 3, ab 1 with D & C. Weight of babies ranged from 6 lbs., 8 oz. to 7 lbs., 1 oz. Past history was noncontributory wih no abdominal surgery. Admitted at $34\frac{1}{2}$ weeks gestation because of slight vaginal bleeding during the previous 2-3 weeks, plus spontaneous rupture of the membranes 24-36 hours prior to admission. A stillborn 4 lb., 4 oz. infant was delivered by internal version and extraction. At laparotomy, the uterus was found to have a large rent in the right lateral fundus, and a subtotal hysterectomy was performed.

Summary

I would like to emphasize the following factors as probably being operative in the increased incidence of uterine rupture — increasing numbers of D & C's for diagnosis and incomplete abortion, increased use of oxytocics in labor, increased use of Cesarean section for fetal indications and maternal obstetric problems, and myomectomy.

Review of the obstetrical services of the two hospitals in Great Falls for the ten year period 1959 through 1968 showed 17,236 deliveries, during the course of which five ruptured uteri were recognized and treated.

Three of these were discovered incidentally at elective repeat section, but two were the genuine, coronary-inducing article. This gives us an over-all incidence of 1:3,727 deliveries, or 1:8,618 deliveries if the silent ruptures are eliminated. There were two perinatal deaths for a rate of 40 per cent, or a corrected rate of 100 per cent. There was one maternal death for an over-all maternal mortality rate of 20 per cent or a corrected rate of 50 per cent if the silent ruptures are eliminated. Age range was 21-36 years, gravidity 3-8, parity 2-6. •

Wilson's disease

Importance of the Clinical Laboratory in Diagnosis and Treatment

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This paper stresses the importance of early diagnosis and treatment of Wilson's Disease. Some researchers believe that treatment of asymptomatic patients will prevent the damaging manifestations. The clinical and biochemical findings, methods of laboratory diagnosis, and prognosis are reviewed.

Hepatolenticular degeneration, or Wilson's Disease, is characterized by cirrhosis of the liver, degeneration of the basal ganglia with resulting neurologic and psychologic changes, ocular Kayser-Fleischer rings, and, on rare occasions, blue lunulae of the fingernails. One or all of these features may exist in any single patient. Jaundice, ascites, splenomegaly, tremor, dysarthria, ataxia, incoordination or personality changes may occur. The most specific clinical finding is the Kayser-Fleischer ring, a greenish-brown ring at the corneal margin. This often can be seen on direct observation, but slit lamp examination may be required.

Because of its many and varied clinical presentations, Wilson's Disease has several synonyms. The most common is hepatolenticular degeneration; others are progressive lenticular degeneration, pseudosclerosis of Westphal and Strumpell, and tetanoid chorea of Gowers.

Wilson's Disease is due to an autosomal, recessive genetic defect. One patient studied by Gedikoglu was found to have a heterochromatic pair of chromosomes in the 6-12 series.[1] Studies, such as Bearn has done on the familial incidence of the disease,[2] indicate that the trait is recessive with the heterozygote phenotypically normal. Although hypoceruloplasminemia so far appears as the primary genetic defect found

in Wilson's Disease, studies by Cartwright and associates indicate that it is not the sole defect.[3] There appears to be an additional unknown genetic defect or, perhaps, several defects together which complicate the pathogenetic picture.

Ceruloplasmin is a copper-binding protein found in the α_2-globulin fraction, and is an oxidase. Copper, following ingestion, is loosely bound to albumin, and after a few hours it is more tightly bound by ceruloplasmin. The copper comprises 0.32% of the ceruloplasmin, each molecule of ceruloplasmin containing 8 atoms of copper. Van Den Homer and Buyze, as quoted by Henry, have estimated that the copper bound to ceruloplasmin comprises 57-89% of the total copper in the serum.[4]

The first complete description of this disease was published by Kinnier Wilson in 1912.[5] Previously, Westphal, in 1883, and later Strumpell, had described a condition they called pseudosclerosis (evidently overlooking the cirrhosis of the liver) which was later shown to be the same disease as described by Wilson. In 1902, Kayser described the dark corneal ring, which was later related to Wilson's Disease by Fleischer. Hourowitz, in 1930, found that the copper content of brain and liver was increased in patients with Wilson's Disease. In 1948, Mandelbrote and his associates found that the urine copper was increased and that this increase was accentuated by the administration of BAL. Also in 1948, Uzman and Denny-Brown found aminoaciduria in patients with Wilson's Disease. In 1968, Sternlieb and Schienberg discovered that clinical symptoms may be prevented from developing by the treatment of asymptomatic patients with oral penicilliamine.[6]

It is the purpose of this paper to emphasize to the medical technologist, the pathologist, and the clinician, the importance of serum ceruloplasmin, urine copper, and hepatic copper levels in the early diagnosis of Wilson's Disease. The clinical and biochemical findings of importance in Wilson's Disease will be reviewed, including a review of some methods used. Additionally, the prognosis of patients who have early diagnosis and of patients in whom the diagnosis is not made until the disease has become clinically manifest will be compared.

Findings

According to one theory, this disease results when copper, not bound to ceruloplasmin, is absorbed through the capillary membranes resulting in increased deposition of copper within the inter- and intra-cellular tissue compartments.[7] Almost all tissues of patients with Wilson's Disease have increased copper, the effects of which cause the clinical symptoms. Patients are rarely seen with clinical symptoms before age 6, and some remain normal until the fifth decade. Usually the clinical symptoms appear between late childhood and early adult life. It is possible that the variation in appearance of clinical symptoms in different people is secondary to different rates of copper deposition in the cells.

Cirrhosis of the liver is commonly seen in this disease and, in fact, Wilson's Disease should always be looked for in children with cirrhosis. Findings of hepatitis, jaundice, ascites, splenomegaly, bleeding, easy bruisability and hemolytic anemia may be present.

In addition, some patients may manifest neurologic symptoms secondary to degeneration of the basal ganglia. Often the first sign of neurological disease is psychiatric, with a distinct personality change. Other signs include tremor, dysarthria, ataxia, and incoordination.

The greenish-brown ring around the cornea, the Kayser-Fleischer ring, is the only sign that is found exclusively in Wilson's Disease, and its presence makes the diagnosis certain.[8] Korn, in his study, confirmed the presence of copper in the cornea of such patients.[9] Renal tubular and glomerular function is effected although symptoms are minor, most often being observed after the diagnosis of Wilson's Disease has been made.

Bone and joint involvement may be characterized by osteoporosis, rickets, pseudofractures, and osteo-arthritis. It is possible that the first three of these are caused by the impaired renal function, but also possible that the joint changes are caused directly by the copper toxcity. Blue Lunulae of the fingernails has been reported,[10] but there is no clear evidence that this is confined to or related to Wilson's Disease.

According to Cartwright, "The triad of Kayser-Fleischer rings, cirrhosis of the liver,

and signs of basal ganglia disease is pathognomic of this condition."[11] However, Wilson's Disease may be present with only one or more of these clinical signs; therefore, more careful familial, clinical, and biochemical studies must be done in order to properly diagnose each patient.

The major biochemical tests in Wilson's Disease are measurements of serum ceruloplasmin and copper in the serum, urine and tissues. Other alterations in both serum and urine chemicals have been noted and are of relative interest. Serum ceruloplasmin levels are markedly decreased (less than 20 mgs%) in patients with Wilson's Disease.[6] The heterozygote may have a slight decrease, and a decrease may be present transiently in normal people. Sternlieb, Schienberg, and Lygren found that a biochemical diagnosis, based on ceruloplasmin levels, can be made more than a year before clinical symptoms appear.[13,6] Lygren maintains that measurement of copper oxidase activity would be a good screen for Wilson's Disease.[13] Certainly, it is imperative that the ceruloplasmin level be determined in any case in which Wilson's Disease is suspected.

The literature contains contradictions concerning serum copper levels. Richardson, in his study, found serum copper to be reduced,[12] as did Bearn in his study.[2] O'Reilly, however, found the non-ceruloplasmin copper in serum to be increased.[9] Cartwright asserts that the total plasma copper is decreased but the direct reacting copper is elevated.[11] Markowitz found little correlation between the serum copper and ceruloplasmin.[14] Stein found that the total amino acid distribution in plasma is normal in Wilson's Disease, both in fasting and postprandial patients.[15]

Hypercupriuria is prevalent in Wilson's Disease and a urine copper greater than 100 ug/24 hours, especially in the presence of decreased ceruloplasmin, is highly indicative. Urinary excretion of copper is greatly increased by the administration of certain drugs, such as BAL and penicillamine, and may be used as a means of following treatment.

Amino aciduria is found in some patients, but these findings are not consistent. The same amino acids are not demonstrated in all the patients in which it is found. Stein found that the excretion of amino acids in the urine of patients with Wilson's Disease may be sensitive to diet and reflect the amino acid intake.[15] This would account for the variation of findings. Some patients exhibit peptiduria, proteinuria, glucosuria, uricosuria, phosphaturia, hematuria, and hypercalciuria as well. These findings probably reflect aspects of abnormal renal tubular function.

Although copper deposition occurs in all tissues of the body, liver biopsy is the most convenient method for demonstrating this increase. Sternlieb and Scheinberg feel that a hepatic copper level greater than 100 ugs/gm dry liver is evidence for Wilson's Disease. They also feel that the histochemical stains for copper are unreliable.[6] The characteristic pathologic findings in the liver are listed in the textbook by Harrison.[11]

Laboratory Methods

It is of utmost importance that copper contamination of all equipment and reagents be carefully eliminated before attemping to test for copper. Copper carbamate is measured photometrically and is the color compound formed in the group of methods for copper analysis using diethyldithiocarbamate. Some other photometric procedures use biscyclohexanoneoxaldehydrazone, neocuprine, or bathocuproine as color reagents. Diphenylcarbazone, oxalyldihydrazide, or rubeanic acid may also be used as color reagents in photometric procedures. Varley[16] and Henry[4] both present methods for serum and urine copper, using diethyldithiocarbamate. In addition to photometric methods, copper may be quantitated by polarographic, flame photometric, and atomic absorption methods.

Photometric determination of ceruloplasmin levels may be accomplished by utilizing the oxidase activity of the protein. Most procedures measure the oxidation of p-phenylenediamine (PPD), but benzidine or N, N-dimethyl-p-phenylenediamine (DPP) may be used as the substrate. Wilson describes an automated procedure (Auto-Analyzer) using the oxidation of PPD.[17] Aisen presents a simple, rapid, spot test, also using the oxidation of PPD, which can be used as a screening test.[18]

In laboratories doing immunoelectrophoresis or immunodiffusion, ceruloplasmin levels may be ascertained by these immunochemical means. In the immunoelectrophoretic pattern ceruloplasmin appears as a weak line between haptoglobin and a_2-macroglobin (the same area in which it appears on starch gel electrophoresis), but can be easily detected by utilizing its oxidase activity with PPD. When using immunodiffusion technics, the precipitin line formed can be quantitated as with other proteins.

Other, less used, methods for ceruloplasmin are: (1) rate of oxygen consumption (Warburg Apparatus), using PPD as the substrate, (2) chromatographic isolation, (3) measurement of the absorption of light at 605 mu before and after the destruction of the blue color, and (4) the total copper level after removal of free or loosely bound copper. The amino acids in the urine can be separated and identified using chromatographic methods. Nearly all chromatography systems have been adapted to amino acid assay.

Copper, in liver tissue, can be spectrophometrically determined, after wet digestion, and is the procedure that Sternlieb and Schienberg used in their study.[6] In this same study, they found the histochemical staining test for hepatic copper to be inaccurate.[6]

This brief review has been presented, not to indicate a specific procedure for any particular laboratory, but simply as a demonstration of the many types of procedures available to the clinical laboratory in which biochemical tests for the diagnosis of Wilson's Disease are to be offered.

Prognosis

Wilson's Disease is "progressive and invariably fatal if untreated."[11] The usual course of the disease is 5-10 years, but it may be acute and terminate in several months. Death is usually due to intercurrent infection or hepatic failure. In some chronic cases the disease may be present for 30-40 years. Walshe contends that the gene "tends to run true in any given family."[19]

Treatment

By preventing the continued accumulation of copper in the tissues and by removing the copper already deposited in the tissues, treatment is in most cases effective. There is improvement in the clinical symptoms, but complete functional restoration cannot be expected in irreparably damaged organs. Therefore, the earlier the treatment is started, the better the chance of reversing the symptoms. The usual treatment is three-fold: (1) limiting copper taken into the body by using a low copper diet, (2) potassium sulfide with meals, which prevents the absorption of copper by forming insoluble, nonabsorbable copper sulfide, and (3) the use of chelating agents, the most effective and therefore the most commonly used one being D-penicillamine.

Most researchers[6,7,12,13,19,20] agree that diagnosis of the asymptomatic homozygote is possible by biochemical tests and that immediate and continued treatment of these patients will postpone, if not prevent, the appearance of the damaging manifestations of this disease. Sternlieb and Schienberg have treated 42 asymptomatic patients with Wilson's Disease who have remained asymptomatic during a period of observation equal

to 142 patient years.[6] On the basis of the cumulative percentage of 121 symptomatic patients, they calculate that eight patients in their study should have developed symptoms; none have. Although there has been some controversy over the statistical evaluation of their findings[19,20,21,22] this study seems to be significant. Walshe feels that if a person receiving prophylactic treatment outlives or stays asymptomatic considerably longer than elder siblings with Wilson's Disease, coincidence is highly unlikely.[19]

Conclusion

In view of these findings, it seems imperative that the clinical laboratory offer the biochemical tests for copper and ceruloplasmin necessary for the practicing physician to correctly diagnose patients with Wilson's Disease. Walshe has stated "To any physician who has seen untreated or neglected cases of Wilson's Disease the suggestion that it may not be necessary, much less desirable, to seek out asymptomatic persons homozygous for the gene of this disease can be nothing but anathema . . . . If we can prevent the onset of a life-endangering illness, we have a moral obligation to take the necessary steps, and to fail to do so would be as ethically unacceptable as it would be legally hazardous."[19] Just as the clinician is morally obligated to arrest the symptoms of this disease, so the clinical laboratory personnel have the moral obligation to offer the test necessary for an accurage diagnosis. •

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Statutes governing medical boards

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AROUND THE TURN of the century, shortly after many territories became states, laws regulating the practice of medicine were enacted. There was a common pattern for these acts. Laws created a board of medical examiners, and the construction of the board, appointment of its members, the number of meetings, and even the subjects and specific grades of examinations were provided for. At that time, all applicants took the examination and nearly all went into general practice. There was no reciprocity, few if any specialty boards, and the National Board and the "Flex" examination did not exist. Since then, the practice of medicine, and certainly medical education, has changed greatly, but few states have rewritten their medical practice acts, most of them merely making amendments.

In 1964, Montana had an obsolete, conflicting law which was difficult to administer. Over four years ago we began the study and rewriting of our medical practice act. We followed the "Guide to the Essentials of a Modern Medical Practice Act," prepared several years ago by a committee of the Federation of State Boards. We used it because of its excellence, but we were also hopeful that if we in Montana followed the recommendation of a model law that other states would do likewise, and this would lead to standardization of medical practice acts. If we are ever to have standardization in medical licensure and solve the problems of reciprocity, we must have similarity of the statutes which spell out the ground rules for the operation and function of the medical boards of the various States. The board may do what the statute authorizes and it may not do what the statute prohibits.

Everything that a medical board does must be consistent with the law, and all acts are appealable to a proper court. For example, in the important matter of licensing doctors, the requirements must be met in all particulars. If that is not done, a clever attorney in court may challenge a medical witness or litigant who has a questionable license to practice, and place him in serious jeopardy or embarrassment.

Medical boards are part of the executive branch of state government, yet the legislatures grant them authority to write rules and regulations — a legislative function. Medical boards, especially those who also act as disciplinary boards, have police and discretionary powers — a judicial function. To carry out these assigned duties in a legal way, it is most important to have the purpose and intent of the law spelled out in the statute. Most doctors have similar ideas of what the practice of medicine is all about, but it must be remembered that lawyers, judges and courts interpret what is done and what is proper by the wording in the law and not by what someone happens to think. The Model Act of the Federation of State Boards contains an excellent statement of the "purpose and intent" of a medical practice act, and such was used in Montana. Modern laws usually contain such a section. The Model Act contains an excellent definition of the practice of medicine. A definition is important when it deals with so vital a matter as the health of the people. It is noteworthy that a clearcut and adequate definition of the practice of medicine is usually absent in many of the laws which I have read. If something is to be licensed, that something should be well defined. The legal document granting the privilege to practice medicine carries with it great privileges and responsibilities, and they should be clearly expressed.

Most, if not all, states require similar education and graduation from an accredited

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class A medical school, as well as in internship at an approved hospital. All applicants for licensure take an examination, and if they pass are then licensed to practice medicine and surgery by an impressive document with beautiful printing, state seals, and many signatures. Some statutes and licenses state that the holder may practice medicine and surgery in all of its branches. Up to that point there is equality of licensees, but that equality has a short life. After beginning practice, the physician finds that hospitals accredited by the Joint Commission on Accreditation have boards and many staff committees. He finds that there is a delineation of privileges and that a committee tells him what he may and may not do, and sometimes how to do it. Then and there arises a conflict between what the state medical board of a sovereign state has licensed him to do, and what a committee allows him to do in a hospital. The question arises whether a committee of a hospital can sit as a superior medical board, and by what authority? Montana, in our medical law enacted in March of last year, has attempted to reconcile that conflict. We used the definition of the practice of medicine in the Model Act, whose section on "authorized practice" states that the holder may perform one or more of the acts embraced in the definition in a manner reasonably consistent with his training, skill and experience. Thus, in Montana, the practice authorized must be consistent with the training, skill and experience of the licensee. Also, the Montana law states: "The board may grant a license subject to terms of probation or other conditions or limitations set by the board." I know of no other state that so qualifies a license, and we believe that such qualification is necessary and consistent with what is going on in medical practice. This qualification is of even greater importance in those states which have a double standard and license both medical graduates and osteopathic graduates to practice medicine and surgery. It does not appear that it is intended for a dermatologist to reduce fractures, a psychiatrist to do surgery, or a pathologist to deliver babies, and all be legally authorized to do so by a document hanging on the wall.

Law is living and breathing, and it should be current with the changes in social living. The law which applies to medicine should be no exception.

The Federation of State Boards has spent much time developing "Flex" to bring about equality of licensure. It is equally important to have equality and standardization of the statutes. It is recommended that each board take a hard look at its governing law. An ounce of prevention is worth a pound of cure. If extensive amendment is needed, it is more simple, from a legislative standpoint, to rewrite the law completely. The statute should spell out clearly the guidelines and give necessary authorization for the board. Specifics such as examination subjects and the passing grade should be left for the board to specify in its rules and regulations. Rules and regulations are easily changed but laws are not, and it is certainly not prudent for medical boards to appear before the legislature at every session. With proper development, preparation and consultation with the state medical association and component local societies, there should be little difficulty in getting a needed law passed. Medical men, with legal assistance, should write it, and have it cleared and in good shape before going to the legislature so that amendments won't be necessary. Legislators can distort a perfectly good act by amendments.

The legislature vests in the board of medical examiners the sole authority to license practitioners of medicine. With that authority and duty, the board may not delegate its powers to anyone else, and especially not to some committee or organization over which the legislature has no control. For endorsement of the National Board or the "Flex" examination, according to the constitutions of many states, specific authority is necessary. In the matter of reciprocity, most states require that there be equal standards and qualifications, and also that there be mutual reciprocity between them. It is nearly impossible to determine the standards and establish formal reciprocal relations in all fifty states, and keep them current. So, in Montana, our law states that we may license physicians licensed by another state if, in the opinion of the board, the sister state has equal qualifications. Mutual reciprocity is not required. •

I thought, we have geared the machines and locked all together into interdependence; we have built the great cities;

Now there is no escape.

We have gathered vast populations incapable of free survival, insulated from the strong earth, each person in himself helpless, on all dependent.

The circle is closed, and the net is being hauled in. . . .

—Robinson Jeffers.

Aging, cancer and environmental micro-insults*

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The onset of aging and cancer is influenced, if not precipitated, by micro-insults from chemical and biological factors that continue to persist and accumulate in our environment.

Man and his technology have promoted conditions in his internal and external environment which have increased his general health and longevity to a level far above his antecedents. He employs vaccines and antibiotics to combat invasive microorganisms, diets and drugs to conquer metabolic diseases, and tissue and organ transplants to replace those eroded by time and disease. He now stands at the threshold of preventing or curing cancer and altering the course of diseases resulting from genetic aberrations and aging. At the same time, he tempers his external environment by mitigating the effects of environmental extremes with edifices scientifically constructed for comfort and safety. He eliminates human wastes through the greatest of medical engineering feats, our sewage disposal system. Eventually, by modifying and controlling weather and other physical phenomena of Nature, he hopes to develop an environment for optimal productivity and health.

Man's technology, in effect, shields him from the gross insults of an environment that killed, maimed and prematurely aged his predecessors. With his technology, however, the gains in health and longevity are being offset by the befouling of our planet with discards of abundance. Now, the factory smokestack and burgeoning urban areas, symbols of industrialization and an exploding population, combine to foul air, land and water to change the quality of life in both obvious and subtle ways.

The expectation

Currently, the expected life-span of modern man in the U.S. approximates 70 years; some may reach the century mark, none will survive beyond 115. Soviet claims for longevity in excess of 120 years fail to stand up to critical inspection and should be disregarded. With each decade, however, man should realize additional years of longevity, indeed, a life-span of 125 years or more, promising at least 50 more years of a creative and healthful life, has been predicted for man by the noted physiologist Anton Carlson. This presumes, of course, that man continues to reduce the severity and frequency of insult to his body by creating and maintaining a favorable environment for himself. It also presumes that our understanding of the aging process and its accompanying pathologic changes, particularly those expressed as neoplasms, reaches the point where we can abrogate these changes.

The aging process in review

Our understanding of the aging process seems to be confined to those obvious morphologic and functional changes that reduce the efficiency of tissue and organs and ultimately lead to death. Aging affects all organs of the body even under ideal conditions

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and the process can be accelerated by specific forms of injury or insults to the body. Hints of aging are evident as early as the sixth year of life when temporary tissues such as deciduous teeth of the youngster are shed or between 11 and 16 years of age when the thymus gland atrophies in response to sex hormones. In contemporary man, a slow, progressive decline of organ and tissue function becomes evident in the so-called autumnal forms of tissue by age 40. These comprise two separate groups, the persistent structures and the endocrine-dependent organs. The former group consist of joint cartilage, ligaments, bone, and diffusion membranes such as the synovia and the choroid plexus. These tissues show progressive degenerative changes after 40, and replacement or regeneration is minimal. The second group of structures include the breast, prostate, gynecologic tract, thyroid gland and the ovaries but not the testes. In these organs, storage functions tend to persist while the secretory and ductal functions diminish with age. Endocrine-dependent organs show a variety of reactions to aging, particularly in the form of neoplasia.

A third group of structures responding to the aging process are the permanent tissues which have been classed as perennial and immortal tissues. The perennials persist a lifetime and do not undergo self-renewal. They include the central nervous system, myocardium, retina, renal glomeruli, lung, permanent teeth and voluntary muscle. These show a progressive decline in function and structure after 60 years of age.

It can be calculated from available data that the central nervous system, chiefly the brain, loses approximately 2.50×10^9 cells or roughly one-fourth of the brain mass in a life-span of 70 years. This represents a loss of 150,000 cells daily from age 17 when peak memory and learning functions of the brain begin their slow and progressive decline to gross senility. Similarly, the kidney of man experiences the loss of one nephron per day from a total of 2 million, or 25,000 in a lifetime.

The immortal structures maintain themselves under normal conditions by a process of continual self-renewal. These structures include loose connective tissue, reticulo-endothlial tissue and organs, involuntary muscle, epithelial lining of the digestive, respiratory, and urinary tract, salivary glands, liver, pancreas and the epidermis. Aging of cells in these tissues occurs regularly throughout life but they are replenished through proliferation of stem cells. Natural aging of erythrocytes, for example, leads to a daily loss of 300 billion cells in a healthy 160 pound adult, most of which are restored by proliferation of precursor cells in the bone marrow. Aging eventually begins to take its toll even among the immortal tissues as precursors cells themselves are gradually depleted or exhausted by intrinsic or extrinsic environmental factors.

Molecular mechanisms of aging

Various mechanisms have been proposed to explain the development of the aging process, all attempting to define the molecular events or micro-insults which impair the function of cells and, eventually, the organ itself. Among the more popular mechanisms appearing in the literature, the most compelling are the following:

(a) **The clinker theory** predicts that metabolic by-products of cellular metabolism accumulate in tissues and organs reducing the operating efficiency of cells. Such conditions are most likely contributed to by arteriosclerosis where narrowed or occluded blood vessels serving a particular organ fail to provide adequate levels of oxygen and nutritional elements as well as failing to dispose of metabolic by-products as they accumulate. In support of this concept, a recent study on elderly patients revealed that 30 intermittent exposures of 100 per cent hyperbaric oxygen significantly improved post-treatment performance of these patients in psychological tests of cognitive functioning. The improved mental state persisted for many hours beyond the peak oxygen levels in the blood and suggested that improved metabolic activities may have contributed to elevated mental functions.

(b) **The somatic mutation theory** predicts that somatic cells of the body experience mutations in their genetic apparatus altering the metabolic functions of the cells.

In this regard, it is interesting to note that dogs live, on the average, six times longer than mice. Research on both animals has clearly shown that dogs experience six times fewer mutational events than mice. This seems to suggest that increasing errors in the genetic apparatus contributes to synthesis of aberrant macromolecules or failure of synthesis of macromolecules, shortening the life of the cell, the organ and ultimately the animal itself.

(c) **The immunologic theory** predicts that chemical configurations in tissues and organs are recognized as foreign by our immune apparatus giving rise to autoimmune disorders. The complications of many autoimmune syndromes including the hemolytic anemias, pernicious anemia, thyroid disorders, blood dyscrasias, sterility and collagen diseases present some symptoms reminiscent of aging. The more common situation in man, however, could be visualized as a chronic, low grade immune response to tissue antigens giving rise to gradual degeneration and atrophy of a variety of organs as seen in lupus erythematosus.

(d) **The biologic clock theory** predicts that aging begins with the activation of "aging genes" or the deactivation of genes vital to the life of the cell. This concept presupposes that at some prescribed time in the life of the cell or organ, the biologic clock sets into motion a series of degenerative changes that occur even in the most favorable environments.

Environmental factors and aging

Many environmental factors have been implicated in shortening the life-span of man by accelerating the natural aging process or by simply killing him. Those environmental factors that grossly insult the body are readily recognized and the application of knowledge acquired through research are diminishing their contribution to aging and cancer. Among these are bacterial infections, parasitism, high fat diet, low caloric intake, obesity, temperature extremes, etc.

Man's chief concern should lie, however, with those environmental factors that operate in or interact with the human body in insidious and subtle ways (micro-insults). Chronic exposure to irradiation of various types are to be included in this category since it has been shown to induce cancer and produce pathologic changes indistinguishable from aged tissue.

In July, 1969, Dr. John Holland, noted virologist from the University of California at La Jolla, presented a most provocative discussion at Montana State University on the nature of cancer viruses and the aging process. The gist of his presentation is emphasized for reasons that become apparent as his concepts are developed.

An abundant literature reveals that viruses such as rubeola, rubella, varicella, herpes simplex and Epstein-Barr (EB) virus remain in the cells of the body for most of the life of an individual following a childhood infection. Indeed, it has been estimated that 20 to 30 different types of virus reside in cells of a healthy adult. Dr. Holland argued convincingly that an impressive body of clinical evidence now implicates these viruses as a cause of cancer and that oncogenic viruses as a separate group of infectious agents may not exist. Moreover, these same agents may not only contribute to accelerated aging through chronic micro-insults but they may, because of their strategic position in the cell, represent the single most important factor which sets the aging process into motion. The fact that antibody titers to these viral agents remain high throughout life strongly suggest that they persist for a lifetime and chronically and continually insult the body. Measles virus antigen, for example, has been detected in the cytoplasm of brain cells of adult humans years after infection. EB virus, recently isolated from patients suffering from Burkitt's lymphoma and infectious monouncleosis, appears to persist for years (27 years in one adult male) in peripheral leukocytes. The concept concludes that in certain individuals, depending upon genetic and environmental factors (co-carcinogens), cells latently infected with one or more viruses may develop signs of aging or oncogenic transformation.

Another group of environmental factors producing micro-insults in cells are those that constitute the pollutants of air, water

and food. The exhaust of a single auto releases 1,600 pounds of CO, 230 pounds of hydrocarbons and 77 pounds of NO_2 each year. The oxides of sulfur are released from sulfur bearing coal and oil at a rate of 30 million tons per year, and by 1980 this figure is expected to reach 48 million tons. The scientific literature now abounds with evidence of increased deaths from lung cancer, emphysema and asthma in large metropolitan areas in contrast to rural areas that can be indirectly attributed to increased levels of CO, CO_2, NO_2, SO_2, phenols, hydrocarbons and lead salts in the air. A potent irritant of the upper respiratory tract, nitrogen oxide in dosages as small as 15 ppm over a forty day period markedly altered lactic dehydrogenase levels in the livers of adult rats. Similar if not more severe subcellular changes undoubtedly occur in the human population exposed continuously to this and other pollutants. Human exposure to 120 ppm of CO for one hour represents a serious risk. At this and lesser doses not only is the inactivation of hemoglobin a serious insult but the formation of formic acid in the blood may promote subtle pathologic changes at the molecular level in any variety of tissues and organs.

Fifty million Americans drink water that fails to meet Public Health Service standards while another 45 million drink water that has not been tested by the Public Health Service. Dr. René Dubos recently stated that no potable water in the U.S. has escaped contamination with one or more of 500,000 chemicals currently being poured into lakes, streams and oceans. The effect of these compounds on human health can not be accurately assessed. However, constant exposure to these agents will predictably bring about subtle changes that may be expressed as clinical diseases and accelerated aging in later years.

The pollution of soil and plants with toxic compounds has led to speculation that ingestion of dust, soil or plant materials may lead to chronic diseases in man. Foremost among these toxic compounds are the pesticides employed for insect control in commercial plants production. The indiscriminate use of chlorinated hydrocarbon pesticides including DDT, chlordane, dieldrin, lindane and endrin has provoked the wrath of naturalist and ecologist alike because of the

—The lowest priced tetracycline—nystatin combination available—

destruction of natural communities, and health scientists themselves are convinced that man's health over a long period of time will be impaired by continuous absorption of minute amounts of these compounds.

It is true that for each commercially available pesticide, long-term experiments have been performed in rats, dogs and other animals. Such experiments in rats have included study of the progeny for three generations. Similar feeding experiments have been carried out in dogs for periods as long as two years. Recently, a team of Chicago investigators assayed 994 specimens of human abdominal wall fat for a variety of pesticides (mostly organochlorine pesticides). As found in previous studies, the principal pesticide was DDT, 72.2 per cent of which was in the form of its more innocuous derivative, DDE. Lindane, dieldrin and heptachlorepoxide were found in varying concentrations in some but not all fat tissue examined. A statistical survey of the pathologic changes in the tissues examined in 668 autopsies showed that there was no significant correlation between the levels of insecticides in the fat and the presence or absence of abnormalities in tissues.

Yet in spite of the fact that no effects have been seen in short term studies in humans and in three generations of rats with daily doses many times that which humans are constantly subjected, there is still doubt that the results can be extrapolated to a whole lifetime of exposure in man. Recent evidence demonstrates that most insecticides are toxic to humans and these chemicals alter physiologic activities of cells.

Conclusion

Man may develop methodologies to repair or replace tissues and organs as they become damaged, but the persistence of deleterious environmental factors will continue to insult the body and create disease. One can only conclude from abundant information already accumulated that the experience of good health and longevity demands fitness of man and his total environment. •

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"Grand Rounds"--Montana, 1970

John S. Anderson, MD, Helena, Mont.

The author writes from his perspective in Montana, but all Rocky Mountain states have similar "Case Histories."

Brinck: Years ago we had to sell environmental control before we were allowed to put it in effect. Now the situation is reversed. The public is demanding more than we are able to deliver.

Health Officer: What we need is to harness the public interest in terms of convincing the Congress and the state legislature to make greater appropriations for environmental control programs.

Comprehensive Health Planning Director (Robert Johnson): I think we will obtain help from the comprehensive health planning effort. Environmental health is one of our major areas of study. We have an environmental health committee that has been very active.

Health Officer: Has the environmental committee made any recommendations?

Johnson: The committee has concluded that Montana needs a system of controlling the location of industries by the issuance of site permits.

Health Officer: This would be a controversial issue. Do you think the public would support it?

Johnson: Comprehensive Health Planning does not operate in a vacuum. It involves people, legions of people. Recently a letter was sent to a large number of citizens asking them to submit questions which they thought needed answers. The universal response was questions pertaining to environmental health. The people wanted to know what was happening, what was needed, and what they could do to help. The public will definitely support any worthwhile solution to an environmental health problem.

Health Officer: How is our patient doing in his waste disposal?

Chief Sanitarian (Vernon Sloulin): If you mean solid waste disposal, he has many problems.

Health Officer: One generally associates solid waste problems with large cities, because there is no more room to dispose of wastes.

Sloulin: Montana has wide open spaces. This creates the problem rather than solves it. Most of our communities are too small to operate sanitary landfills on a practical basis.

Health Officer: Could not this be done by creating sanitary districts?

Sloulin: This has been done in some cases, but the pick-up and delivery to a sanitary landfill site is a problem with our factor of great distances. The legislature has asked us to recommend a feasible method of disposing junk automobiles. If there is a practical method, we have yet to find it.

Health Officer: Could you list any other unmet need?

Sloulin: I could name many, but one of the greatest is that we should have chemical and bacteriological monitoring of food. Our patient asks many questions that we can't answer. For example, last year he asked if it was safe for him to eat pheasants. The pheasants were discovered to have various levels of mercury. I'm afraid that we didn't give him a clear-cut answer.

Health Officer: Mr. Brinck, briefly tell how you have improved our patient's water quality, and then we will attempt to give our prognosis.

Brinck: There has been much improvement in the patient's streams since Montana's Water Quality Act of 1955. During the past ten years municipalities have spent over $15 million dollars for new, or additions to, sewage treatment facilities. Montana was one of the first states to have sewage treatment for every sewered community. Industries have spent about the same amount of money during this period. Streams that were once devoid of life are now popular for trout fishing. We can not relax. Water quality needs further improvement. Timetables for compliance

have been issued to all municipalities and industries. Municipalities have a two-fold problem. They can no longer find purchasers of bonds under the statutory ceiling of six per cent interest. Then the Federal Supreme Court has ruled that Montana's revenue bond act is unconstitutional.

Prognosis

Health Officer: I think we can all agree that our patient has opportunities for a long, healthy, and happy life if he quits his previous reckless habits and plans for the future. There will be temptations for him to acquire wealth now at the expense of sickness later. He has the greatest coal reserves of any state. The nation will need this for its insatiable appetite for electrical power.

We prescribe caution to our patient. He must learn to live with all the systems of nature — because he can not live apart from nature.

We are not the only doctors for the patient. Environmental health has become very popular these days. There are hints that environmental control will be removed from our hands and placed in others. We are pleased that the environment has become so important to so many persons and agencies. We would part with our responsibility most reluctantly. The environment is for people and people should be healthy in the broadest sense. That is why physicians and health departments should demonstrate that they are best suited to make decisions on environmental quality.

The patient, the State of Montana, is being examined by several members of the State Department of Health. The **State Health Officer (Dr. John S. Anderson)** is conducting an evaluation of the patient in terms of his environment health. What is his past history?

Past History

Division of Environmental Sanitation (Mr. C. W. Brinck)*: Since I have been acquainted with the patient over the longest period of time,* permit met to summarize. Montana is one of fifty siblings, being 41st in terms of age, and 4th in terms of body size. He has always enjoyed robust health. He is handsome and knows it. He calls himself, "The Big Country." He possesses great natural resources, being known as "The Treasure State." He was a restless youth. Having grown up under harsh conditions, compared to other siblings, he considers himself the ultimate in manliness and his brethren effete snobs. His early years were spent in trying to make the most money in the shortest period of time. He made no plans. Gold was brought out of the hills and streams with abandon. He didn't realize until later that his effete brothers were making the money, and when the gold was gone he was left with the scars. By sad experience he learned many things. He learned that his many miles of prairie could not all be turned into verdant crop land. The learning process was cruel. He lost much topsoil, silted his streams, lost his native grass cover, had empty pockets and a broken heart. In the same way he learned that there was a limit to the amount of sheep and cattle his land would support. I could recite many more experiments our patient tried. Because he is big and strong, he has been able to survive his errors and is in good health today.

*Mr. C. W. Brinck has been employed by the Montana State Department of Health since 1936.

Health Officer: We have been appointed to take care of this patient since the turn of the century. From what I can learn, the patient didn't always want much of our help.

Brinck: That is right. For example, he didn't understand that for his own good he should have a safe water supply. Water was taken from the mountains right into the city mains without treatment. The first chlorination was in 1911. Now all public water supplies using surface water are chlorinated.

Health Officer: What was the biggest obstacle in convincing the patient that he should chlorinate his water?

Brinck: Doctors!

Health Officer: That may have been true, but you must remember that this was right after World War I when chlorine was used as a poison gas. Many physicians were opposed to its use and the public objected to "tampering with nature." Typhoid fever was not uncommon and several epidemics convinced our people that they would need to have pure water.

Dental Officer (Dr. A. J. Terrill): We have a similar problem now convincing people that they should fluoridate their water, except now we have the physicians and dentists on our side.

Health Officer: What kind of work were we doing then, that we are not doing now?

Brinck: We did more work with food. I can remember that we were interested in the number of worms per can of huckleberries. More than three worms per can was not considered acceptable. We would pour gasoline over the berries, agitate the can, and the worms would come to the top! We also did some checking on marijuana as there was quite a bit of it being grown in Montana.

Health Officer: Was there a marijuana problem then?

Brinck: Its use was mostly confined as part of the culture of Indians and Mexicans in the lower Yellowstone Valley.

Present Condition

Health Officer: So much for the past, what is the condition of the patient today? We public health practitioners have become specialists in several areas. Let us first look at our patient's air.

Air Pollution Chief (Benjamin Wake): In general, his air is good, but he has achieved national notoriety because of some bad conditions that exist.

Health Officer: What are his good and bad points?

Wake: His Eastern two-thirds are blessed with wind. Almost anything that is emitted is dispersed rapidly. The mountain valleys in the West and the confined areas along the Yellowstone River have very little capacity to disperse air contaminants. It is here where the population is concentrated along with the industries.

Health Officer: Has his health been affected in some places?

Wake: Yes, his trees have been damaged and in some places killed. Fluorosis in cattle has resulted in damage suits against the phosphate industry. Physicians feel that there has been an increase in respiratory ailments which correlates with air pollution.

Health Officer: Are Montana physicians concerned with air pollution?

Wake: Yes they are and their interest is growing rapidly. We need their support. We have a good Montana Clean Air Act. The Board of Health has issued regulations considered as strict as any in the nation. When these matters were discussed in public hearings we could have had more testimony from the medical profession.

Health Officer: What do you need to accomplish your objectives?

Wake: The public expects much. We can make as much progress as there are people to do the work. We are unable to recruit qualified staff because of salary restrictions imposed by the Montana legislature.

Water Pollution Engineer (Don Willems): The same is true for progress in water pollution. I spend much of my time answering letters. The public wants to know what we are doing. I am almost at the point of replying that we aren't doing anything because all our time is taken up in writing answers to your letters.

Health Officer: That seems to me to be a poor use of an engineer's time. Maybe we should hire a public relations expert so that you could practice your own specialty.

WIND RIVER WILDERNESS DIABETIC CAMP

DUBOIS, WYOMING

July 19-August 14, 1970

Sponsored by the University of Wyoming, the camp is a 4-week program for boys age 13-18 years old. For detailed information concerning camp program, facilities, cost and scholarships, write Charles P. Cooper, Box 3274 University Station, University of Wyoming, Laramie, Wyoming 82070.

Environmental health - - Urgent challenge of the '70's

Thomas J. Moylan, MD*, Roundup, Montana

THE EARTH IS A space ship of limited carrying capacity, with delicately designed life-support systems. When these are thrown out of balance, man's health is harmed. Hence the physician's increasing concern with environmental health. Long a specialty of medicine, Public or Environmental Health is assuming maximum importance in the '70's. During the past decade, alert people in all disciplines have come to realize that man is today in a position to destroy the life-support capability of the earth. From the Biafran physician seeing starvation to the American physician who treats a patrolman for carbon monoxide inhalation, every physician sees the end result of environmental forces on man.

Here in Montana, our environmental problems are just beginning. Our rivers are not flowing black with industrial sludge—*yet*. We still have many lakes whose shores are not subdivided into acre after acre of summer cottages—*yet*. Much of the Western mountain area is free of air pollution—if the wind is right. A committee of the Montana legislature has pesticide control under consideration. Our legislature has passed laws regulating dredge mining, even though these laws are being challenged in the courts.

The Clark's Fork river in Western Montana as recently as two years ago was subjected again to leakage of fish-killing copper salts. Missoula, Billings, Helena and now Columbia Falls are developing significant air pollution. A weed killer used for irrigation ditches on the Musselshell River recently leaked back into the river, killing fish along at least a two-mile stretch. The safety of ground water supplies in areas of oil exploration depends on proper "plugging" of strata-piercing well shafts, an expensive process in an already expensive dry hole. There is genuine concern over the establishment of a chemical industry in the already severely threatened Missoula area. A multimillion dollar formaldehyde plant could suddenly increase the already significant air and water pollution there.

The Montana State Department of Health is monitoring these problems and enforcing standards. The State Health Officer, Dr. John S. Anderson, and his dedicated staff are, however, operating under severe budgetary restrictions, while environmental problems that at one time developed gradually now mushroom overnight.

There are things we physicians can do. We should work with our own State Department of Health in planning toward a livable environment, for the Health Department is the physician's extension within the governmental process. We should make certain that the divisions of environmental sanitation, of air pollution and industrial health, and any other departments dealing with environmental considerations, are properly funded for the jobs they are expected to do. Any state government re-organization measures must be scrutinized for their effects on Montana's health. Environmental monitoring and enforcement should remain a function of the State Department of Health.

Other Areas Of Concern

1. The rapid development of subdivisions are producing an urban sprawl along Montana streams. Our streams will rapidly become little cities—some already have, in fact —unless we institute land use planning, leaving flood plains for hay meadows and game cover, and planning any development on plateaus away from flood plains. Such planning would prevent pollution of the stream

*Chairman, Committee on Public Health and Well-Being, Montana Medical Association, Roundup, Montana.

as well as disasters from flooding. The streams presently threatened by housing developments are the following: Rosebud, Stillwater, Flathead, Kootenai, Big Spring Creek, Warm Springs Creek, Smith River, Shields Creek, and Bell Creek. Flathead Lake is totally subdivided and is having pollution problems. Canyon Ferry Lake is heavily subdivided, and the process is beginning on Fort Peck Reservoir. It is possible for these rivers and lakes to tolerate a certain number of residents and retain their natural flavor. Develop them beyond this—to the second and third rows of bungalows as is occurring on lakes in Minnesota, and the flavor will disappear, to be followed by pollution and eutrophication.

2. There is need for a program of industrial site permits so that factories and other sources of pollution are located where their environmental burdens can best be tolerated. The fluoride pollution at Columbia Falls and Garrison might thus have been avoided. The Columbia Falls fluoride emission is becoming severe enough to affect vegetation in Glacier National Park.

3. In Montana, all state and federal agencies should cooperate to minimize environmental destruction which might attend their activities. We are victims, both in Montana and the rest of the nation, of much tax-subsidized environmental damage. DDT until recently was distributed by the ton with tax dollars. A positive example of planning in action is the Montana Highway Department's new policy of consultation with the Department of Fish and Game in planning highway construction. Thus, a proposed highway's effect on river "meanders" is considered so that the river's gradient remains gradual. Keeping the meanders in our rivers prevents siltation, a most important factor in reducing pollution. There is now, hopefully, an increased attempt to keep the road on the hillside and leave the flood plain for the river and for agriculture.

Such coordination might have prevented such disasters as federal construction of a roadway through the last winter game range in the Kootenai Valley, when it could have easily followed an alternate route along the opposite side of Libby reservoir. Surveillance is needed over the stream-straightening activities of the Army Corps of Engineers, which have changed the natural gradient of many of Montana's rivers, only to have the water pile up farther downstream. Witness the original 1200 miles of trout streams in the Black Hills. Already, they have been straightened to a handy 160 miles! The list of government-perpetrated ecological disasters is long and heartbreaking. Montana physicians must be informed and vocal to prevent such occurrences in the future.

4. Open space is an environmental value we must preserve. It is unique to the Rocky Mountain area and Alaska. Land use planning will preserve this for future generations and, at present development pressures, even for *this* generation. Hawaii has been zoned for industrial, residential, agricultural and recreational usage since statehood. Such an approach in Montana would protect those areas necessary to food production and necessary to the renewal of the human spirit from encroachment by the city and by industry.

5. "Clear-cut" logging in Montana's national forests must receive close scrutiny by all Montanans and, for that matter, all Americans. This practice leaves the forest in an unsightly condition and, with the soil bared and bulldozed, leads to stream siltation, especially when 60° slopes are clear-cut. A possible explanation is that the Forest Service's funds for operation are directly determined by the amount of timber they designate to cut. This would require appropriate action by the United States Congress, a move secretly hoped for by the Forest Service itself.

6. Dredge mining, an unsightly practice, leaves ugly scars that never repair themselves. The new Montana dredge mining law is presently being challenged in court on constitutional grounds. Until our Montana Constitution guarantees the individual a right to clean air, clean water and a healthy environment, dredge mining and other industries that destroy the environment will continue to operate in (and on) Montana without adequate controls or reclamation practices.

7. Unmodified land is a health resource in giving man contact with the primitive. Montana has some of the last great wilderness remaining in our highly developed nation. It is here and in our open space that the spirit of Montana and of Montanans lives. One may seldom or never get to tread the wilderness paths of our state, but we and *all* Americans must know they do remain, protected from road, from logger, from miner, and even from manmade trail. These areas are the home of mountain sheep, grizzly and mountain lion, and of God-created beauty that is Montana's alone. It is this knowledge and these memories that sustain the spirits of Montanans and of Americans. For the man or woman crushed in the pressure of mass population, there is health in being able to look at the distant mountains and know that there are the silent forests, the elk, the mountain lake.

Yet this great tradition of preservation is again being tested with a federal review of Montana's pristine, primitive and wilderness areas being undertaken in 1972 by the United States Forest Service. Let not Montana's physicians be found wanting. Even now, a clause lurks in our current National Wilderness Act permitting mining of any mineral discovery made in a primitive area before 1983, to be mined in perpetuity after that date by *any economically feasible method.*

What can we do?

The answer to this question is, plenty! We can follow important environmental legislation closely and make our feelings known before and during the 1971 Montana legislative session. This might entail a long distance phone call or letter at the appropriate time. Mr. Hegland, executive secretary of the Montana Medical Association, attends the legislative sessions and can inform you when your opinion would be helpful by telephoning or personally seeing your legislator at Helena or at home. If there is an environmental problem that "bugs" you—get a law written and then lobby for it! Start in your own area by attending city council meetings, city-county planning sessions, etc. Get your political party working on this "hot" issue. The environment issue is heating up politically and, as President Nixon has said, it's now or never.

Educate yourself in the vast field of ecology. A man is effective only if he is knowledgeable. There are many organizations active in this field:

Montana Conservation Council
Don Drummond, President.
Office of the State Forester.
Missoula, Montana 59801

Montana Medical Association,
Committee on Public Health and Well-Being
Thomas J. Moylan, M.D., Chairman
Roundup, Montana 59072

State of Montana
Comprehensive Health Planning Board
Environmental Health Committee
George F. Darrow, Chairman
2100 Fairview Place,
Billings, Montana 59102

Montana Wildlife Federation
Don Aldrich, Executive Secretary
410 Woodworth Avenue
Missoula, Montana 59801

Rocky Mountain Center for the Environment
5850 East Jewell Avenue
Denver, Colorado 80222

The Wilderness Society (Publication: The Living Wilderness.)
729 Fifteenth Street NW.
Washington, D.C. 20005

Trout Unlimited (Montana chapters are functioning)
5850 Jewell Avenue
Denver, Colorado 80222

American Forestry Association (Publication: American Forests)
919 Seventeenth Street NW
Washington, D.C. 20006

Montana Wilderness Society
Ken Baldwin, President
Bozeman, Montana 59715

We must FIRST gain an understanding of the "new" Environmental Health. The field has changed considerably since that "public health" course in medical school. Then, we must apply our knowledge of the human condition to the environment, for it so deeply affects mankind.

Some day, each of us will retire from active practice. We will look around us after treating the last coronary, setting the last bone, or delivering the final infant. If we see that patient or that infant go forth into a grim world of polluted streams, smog-filled communities, or subdivisions in the secret fastness of our mountain rivers; if that is to be the vision of the future, then we will have failed, gentlemen. Failed as citizens and failed as physicians who should lead the citizens in questions of health! •

MONTANA

Physicians in the News

Vasil P. Czorny, MD, Missoula, has been named president and chief of staff of St. Patrick's Hospital. Wesley W. Wilson, Jr., MD, Missoula, was elected secretary of the staff; and F. D. Anderson, MD, Missoula, president-elect. John A. Curtis, MD, Great Falls, has been elected president of the medical staff of Montana Deaconess Hospital. Dan L. London, MD, Great Falls, was named vice-president, and John C. Hanley, MD, Great Falls, secretary. Doctor Curtis succeeds John W. Bloemendaal, MD, Great Falls.

NEVADA

Colorado OB-Gyn Society Gives Statement on Oral Contraceptives

The Colorado Gynecologic and Obstetrical Society Planned Parenthood of Colorado and the Maternal & Child Health Committee of the Colorado Medical Society endorse the oral contraceptives as an important and effective means of fertility regulation and family planning for use with patients who state a preference for oral contraception, whose medical history, physical examination and laboratory tests do not show any irregularities or the presence of any condition which could be aggravated by the use of oral contraceptives.

We recommend that patients receiving oral contraceptives be given follow-up physical examinations at six month to one year intervals, and that no long term prescriptions be written. Important complications are very rare in patients who have used oral contraceptives for six months or longer, and we believe that it should be obligatory for women to see their physicians before receiving renewal prescriptions.

We recommend that patients be offered a choice from the full range of contraceptive methods, and that they be advised of the advantages and disadvantages as well as the benefits and risks of all methods. Patients should also be instructed to relay to their physician any information regarding unexpected side effects.

We will continue to prescribe oral contraceptives when in our judgment they are best suited to the patient and best serve her needs. We believe along with the American Medical Association, the Food and Drug Administration, the World Health Organization, and the British Committee on Safety that the risks both known and unknown must be weighed against the benefits when prescribing the pill, and the risks associated with pregnancy, childbirth and the puerperium far outweigh the known risks of the pill. Extensive studies have revealed no evidence of increased cancer in association with the use of the oral contraceptive in women.

We further believe that the consequences of failed contraception—in terms of unwanted children, illegal abortion, and the inherent risks of pregnancy—give further support to our conclusion that the benefits of oral contraceptives far outweigh the risks. Therefore, we endorse the use of the pill when properly prescribed and administered, and urge women not to "self prescribe" by borrowing pills from their relatives or friends. A woman who does so removes herself from the medical supervision that is her best guarantee against risk.

Reasonable Assurance

"Reasonable assurance" that the School of Medical Sciences at the University of Nevada, Reno, will be fully accredited has been granted by the Liaison Committee on Medical Education. The decision was announced in Chicago in March after a meeting of the Committee of the American Medical Association and the Association of American Medical Colleges.

Dr. George T. Smith, dean of the Nevada school, received a copy of a letter from the AMA-AAMC committee, addressed to Dr. James Allen Jr., U.S. commissioner of education, which said:

"The University of Nevada, Reno, contemplates the establishment of a two-year school of medical sciences, the first students to enter in the fall of 1971.

"The Liaison Committee on Medical Education has studied the plans for this new school very carefully and has authorized me to inform you that, in the judgment of the Committee, there is reasonable assurance that the school will meet accreditation standards and in due time will be fully accredited as a school of basic medical sciences."

The letter was signed by Dr. Hayden C. Nicholson, M.D., secretary of the Liaison Committee on Medical Education.

Nevada's program was authorized by the State Legislature and signed into law by Gov. Paul Laxalt in March of 1969. The Board of Regents had approved the program earlier. Dr. Smith was named dean last June (1969).

More than $8 million has been committed to the school, including gifts from Howard Hughes and other large donors. The State of Nevada has made appropriations for renovation of buildings and for some operating expenses during the first biennium.

THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Adler's Textbook of Ophthalmology: By Harold G. Scheie. 8th ed. Phila., 1969, Saunders. 509 p. Price: $18.90.

Advances In Clinical Chemistry, v. 12: Edited by Oscar Bodansky and C. P. Stewart. New York, 1969, Academic Press. 462 p. Price: $19.50.

Analogues of Nucleic Acid Components, v. 25 (Recent Results in Cancer Research): By Roy-Burman. New York, 1970, Springer-Verlag. 111 p. Price: $6.20.

Bird-Headed Dwarfs: By Helmut Seckel. Springfield, Ill., 1960, Thomas. 241 p. Price: $10.00.

Diseases of The Canine Eye: By F. G. Startup. Baltimore, 1969, Williams & Wilkins. 387 p. Price: Gift.

Disorders of Communication, v. 42: Edited by David Mck. Rioch and Edwin A. Weinstein. Baltimore, 1964, Williams & Wilkins. 519 p. Price: $22.00.

Dream In Psychoanalysis: By Leon Altman. New York, 1969, International University Press. 227 p. Price: $7.50.

Elderly Patient: By Bernard A. Stotsky. New York, 1968, Grune. 160 p. Price: Gift.

Freud: A Critical Re-Evaluation of His Theories: By Reuben Fine. New York, 1962, McKay. 307 p. Price: $1.95.

Genetics of the Dog: By Marca Burns and Margaret N. Fraser. Philadelphia, 1966, Lippincott. 230 p. Price: Gift.

Geriatric Psychiatry: By Kurt Wolff. Springfield, Ill., 1963, Thomas. 125 p. Price: $5.75.

House Officer Training: By Robert H. Moser. Springfield, Ill., 1970, Thomas. 108 p. Price: Review.

The Knee in Sports: By Karl K. Klein. New York, 1969, Pemberton Press. 177 p. Price: $6.95.

Management of Fractures and Dislocations: By Anthony De Palma. 2nd ed. Philadelphia, 1970, Saunders, 2 vols. Price: $55.00.

The Marriage Relationship: By Salo Rosenbaum and Ian Alger. New York, 1968, Basic Books. 366 p. Price: $10.00.

Medicine and Stamps: Edited by R. A. Kyle and M. A. Shampo. Chicago, 1970, American Medical Association. 216 p. Price: Review.

Neurology of Cerebellar Evolution and Development: Edited by R. Llinas. (Institute for Biomedical Research). Chicago, 1969, American Medical Association. 931 p. Price: Gift.

Obsessive Personality: By Leon Salzman. New York, 1968, Science House. 282 p. Price: $8.50.

Physician's Book Compendium, The Medical Book Reference for Physicians: Edited by Max Celnik. New York, 1970. Physician's Book Compendium Inc. 846 p. Price: Gift.

Progress in Clinical Toxicology, v. 4: Edited by Abraham Stolman. New York, 1969, Academic Press. 428 p. Price: $19.00.

Recognizable Patterns of Human Malformation, Genetic, Embryologic and Clinical Aspects, v. 7 (Major Problems in Clinical Pediatrics): By David W. Smith. Philadelphia, 1970, Saunders. 368 p. Price: $16.00.

S. Weir Mitchell, M.D.-Neurologist, A Medical Biography: By Richard Walter. Springfield, Ill., 1970, Thomas. 232 p. Price: Review.

Schizophrenia and the Need-Fear Dilemma: By Donald L. Burnham, Arthur Gladstone and Robert W. Gibson. New York, 1969, International University Press. 474 p. Price: $12.00.

Science and Cancer: By Michael B. Shimkin. Washington, D.C., 1969, U.S. Department of Health, Education and Welfare. 159 p. Price: Gift.

Suicidal Behaviors, Diagnosis and Management: By H. L. Resnik. Boston, 1968, Little, Brown. 536 p. Price: $15.00.

Synopsis of Ear, Nose and Throat Diseases: By R. E. Ryan and others. 3rd ed. St. Louis, 1970, Mosby. 379 p. Price: $10.75.

Synopsis of Obstetrics: By C. E. Leenan and E. C. Sandberg. St. Louis, 1970, Mosby. 496 p. Price: $8.50.

Textbook of X-Ray Diagnosis, v. 1: Edited by S. Cochrane Shanks. 4th ed. Philadelphia, 1969, Saunders. 688 p. Price: $21.00.

The Therapeutic Nursery School: By Robert A. Furman. New York, 1969, International University Press. 329 p. Price: $10.00.

Time to Heal; Corrective Socialization: By William Goldfarb. New York, 1969, International University Press. 148 p. Price: $5.00.

Treatment of Schizophrenia: By Philip May. New York, 1968, Science House. 352 p. Price: $12.50.

Tur; Transurethral Prostatectomy: By George O. Baumrucker. Baltimore, 1968, Williams & Wilkins, 141 p. Price: $6.95.

The Widening World of Childhood: By Lois Murphy. New York, 1962, Basic Books. 399 p. Price: $10.00.

MEDICAL SCHOOL NOTES

University of Colorado Medical School Notes

Dr. Lloyd V. Shields, associate clinical professor of obstetrics and gynecology on the volunteer faculty of the University of Colorado School of Medicine, has been selected to receive the annual "Alumni Achievement Award," of the Ohio State University College of Medicine. The award was presented at ceremonies in Columbus on April 18.

Dr. Shields received his M.D. degree from the Ohio State College of Medicine in 1945 after earning a B. A. from Ohio State in 1941. He has been a member of the University of Colorado medical faculty since 1951, when he was appointed as an assistant in obstetrics and gynecology. He has served continuously since in volunteer and full-time academic ranks and was promoted to associate clinical professor in 1968. During 1968, he was president of the Medical Board of the University of Colorado Hospitals, representing the volunteer and full-time physicians who staff Colorado General and Colorado Psychiatric Hospitals at the CU Medical Center.

* * * * *

The John A. Hartford Foundation Inc., of New York City has made a second three-year grant of $199,598 to the University of Colorado School of Medicine to support a continuing research project by Dr. Ben Eiseman, professor of Surgery, directed at attacking cancer by immunizing patients against their own tumors. The new Hartford foundation grant was formally accepted (March 27) by the CU Board of Regents at its regular March meeting in Boulder. Dr. Eiseman's investigation has been supported since 1967 through an initial grant of $148,172 from the Hartford Foundation.

MEETINGS

University of Colorado School of Medicine
Postgraduate Medical Education
General Practice Review
YMCA Conference Center,
Estes Park, Colorado
June 15-20, 1970

Pediatrics
Aspen, Colorado
July 19-22, 1970

For further information write Postgraduate Medical Education, the University of Colorado School of Medicine, 4200 East Ninth Avenue, Denver, Colorado 80220.

Children's Hospital
Denver, Colorado
Teenagers (Children's Hospital, Denver)
June 12, 1970

A one day workshop on the hangups of the adolescent—and society on such matters as drugs, sex, legal consent and relevance. Fee: $12.00.

Vail Conference on Pediatric Practice (Vail, Colorado) (Sponsored by Denver Children's Hospital)
September 17-19, 1970

5th Annual Colorado-Nebraska Obstetric and Pediatric Conference (Children's Hospital, Denver)
October 30-31, 1970

The W. Wiley Jones Memorial Lecture (Children's Hospital, Denver)
November 13, 1970

Pediatric Neurology (Children's Hospital, Denver)
December 11, 1970

For further information contact: L. Joseph Butterfield, M.D., Director, Department of Continuing Education, Children's Hospital, 1056 East 19th Avenue, Denver, Colorado 80218.

Annual Convention
American Medical Association
Chicago, Illinois
June 21-25, 1970

For more information write: American Medical Association, 535 North Dearborn Street, Chicago, Ill. 60610.

4th Biennial Scientific Meeting
California Society of Anesthesiologists
Sahara Tahoe Hotel
Lake Tahoe, Nevada
June 12-14, 1970

Write: The American Society of Anesthesiologists, 515 Busse Highway, Park Ridge, Illinois 60068.

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OBITUARIES

Colorado

Phillip Albert Loomis, MD, died at his home in Colorado Springs, March 10, 1970, at the age of 96.

Doctor Loomis was born in Illinois on September 21, 1874 and received his primary and secondary education in the Illinois public schools. He later studied medicine at Rush Medical School in Chicago and was graduated in 1900.

Doctor Loomis was a nationally known iris hybridizer, a hobby he started in 1920. Over the years, he won every medal the American Iris Society offered. His Elmohr iris, a mulberry shaded specimen, won the top award, the Dykes Medal in 1945. Doctor Loomis was one of the first plantsmen to achieve a pink iris. This specimen was exhibited at the Chicago World's Fair in 1933-34.

Doctor Loomis was a member of the El Paso County Medical Society and the Colorado Medical Society.

He is survived by a son Phillip A. Loomis, Jr., of Chevy Chase, Maryland, and a daughter, Mrs. Arthur Woodward of Patagonia, Arizona.

Utah

W. Ezra Cragun, MD, Logan physician, died April 6, 1970. He was 59. Born April 11, 1910, in Chicago, he was the son of Dr. Wiley M. and Delphia Hetzler Cragun.

A 1932 graduate of the University of Utah, Doctor Cragun had previously graduated from Weber College. He received his medical degree from Northwestern University, and interned at St. Luke's Hospital in Chicago. He later did postgraduate work at Cook County Hospital in Illinois, and at the University of California.

Doctor Cragun practiced medicine in Lewiston, Cache County, from 1936 to 1950, and was a member of the Lewiston City Council and a health officer for 15 years. He had also served as Chairman of the Board of the Logan L.D.S. Hospital and the Budge Hospital staffs. He was active in the Cache Valley Medical Society, as well as the Utah State and American Medical Associations.

He is survived by his widow, Margaret, one son and three daughters, Wiley Ezra, and Mrs. J. Steven (Elizabeth) Larsen, both of Logan; Mrs. Nole S. (Margaret Ann) Schvaneveldt, Hampton, Va.; Mrs. Gary (Mildred) Watts, Torrance, Calif.; 11 grandchildren; one brother and one sister, J. Ellis of Ogden and Mrs. Stephen (Ruth LaVin) Merrill, New York.

Clarence C. Randall, MD, retired Logan physician and surgeon, died April 2, 1970, at the age of 78.

The son of Henry Clay and Annie Spears Randall, he was born January 1, 1892, in Marion Junction, Alabama. A graduate of Tulane University School of Medicine, Doctor Randall completed an internship at the Touro Infirmary at New Orleans. He later fulfilled his military service as a Lt. in the U.S. Navy, and was a Veteran of World War I. Subsequently moving to Utah, Doctor Randall commenced his medical practice in Logan in 1928. Active there in medical affairs, he served as both the Councilor and President of the Cache Valley Medical Society, and was also affiliated with the Utah State and American Medical Associations.

Surviving the doctor are his widow, Irene; a son, Dr. Clarence C., Logan; three grandchildren; and one great-grandchild.

New Mexico

James Isaac Dunham, MD, 83, was killed when a car struck him near his home in Chama, New Mexico, on February 22, 1970.

Doctor Dunham was born in Silverpoint, Tennessee March 31, 1886. He attended Memphis Hospital Medical College and received his MD from the University of Tennessee in 1915. He interned at St. Luke's Hospital in Denver, and upon completion, established a general practice in Chama, New Mexico in 1916, where he maintained a practice until his death.

Doctor Dunham was a member of the American Medical Association, the Colorado Medical Society, and the New Mexico Medical Society. He is survived by Mrs. Dunham of Chama, a son, James Isaac, and a daughter, Mrs. Agatha D. Longgood.

Montana

Nils Torsten Peterson, MD, Billings, died suddenly on February 24, 1970. Doctor Peterson was born in El Segundo, California, on July 23, 1923. He received his B.A. degree from Pacific Union College in 1945 and his M.D. degree from the College of Medical Evangelists in 1947. After completion of his internship, he undertook postgraduate training in dermatology. He moved to Billings in 1953 to engage in the practice of his specialty. Doctor Peterson had been a member in good standing of the Montana Medical Association and of the American Medical Association, through the Yellowstone Valley Medical Society, since 1953.

Bertram Eckford Lord, MD, Great Falls, died on November 9, 1969. Doctor Lord was born in Shakopee, Minnesota, on October 12, 1880. He received his M.D. degree from the Minnesota College of Physicians and Surgeons in 1903, and was licensed to practice medicine in Montana in 1917. At that time, he established his practice in Great Falls where he continued the general practice of medicine until his retirement in 1953. Doctor Lord had been an active member of the Montana Medical Association and of the American Medical Association, through the Cascade County Medical Society, since 1917.

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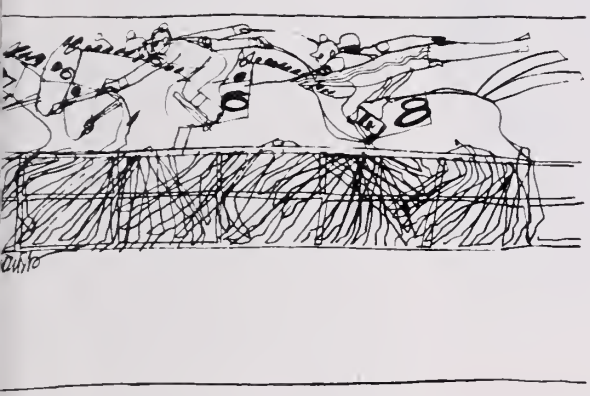

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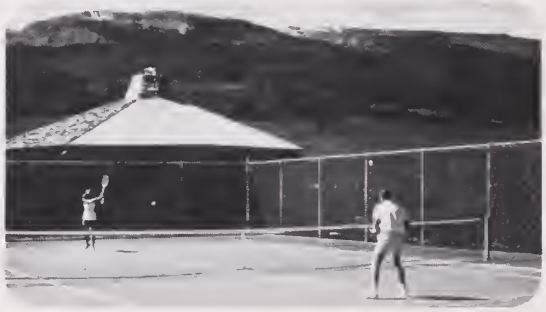

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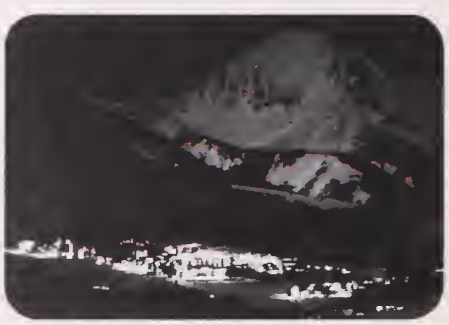
"Communications, the cause of it all" is a three-day family learning experience presented by Colorado Medical Society. It deals with the single most important function that relates one human being to another . . . communication. It is the key to doctor-patient understanding. It's the basis upon which good marriages are built. And, it is, without question, the most important element of parent-child relationship. All members of the Rocky Mountain Medical Conference are welcome.

This is not just a "seminar" because we feel the key to helping you become a better, more effective doctor starts with you as a person, you as a member of a family; then progresses to you as a member of your profession. Helping you become a more effective doctor goes deeper than "programming" you with vast amounts of technical information. It involves the human side of all your relationships . . . communications. It involves your wife, it involves your children, it involves you, and what you really know about your communication with others.

Wild daisies over Snowmass' West Village



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"I know you believe you understand what you think I said, but I'm not sure you realize that what you heard is not what I meant."

It happens every day! Communications are garbled because people have pre-conceived ideas about what you are going to say . . . . . or you have assumptions about people, and it influences what you hear. Sometimes the results are sad. Sometimes they are funny. And sometimes frustrating. "Understanding how you affect communication with others" is the title of the first morning's session. It starts to unconfuse things.

"Forget what is said, just remember to hear what is meant."

"I know that's what Dr. Adams said, but I think what he meant was . . ." Ever heard that before? Or, how about this: Wife: "Do you like my new dress?" Husband: "Yes." Wife: "What do you mean by that?" Husband: "I mean I like it." Wife: "It didn't sound like you meant you liked it." Husband: "Now you made it sound like I don't like it." Wife: "Do you?" Husband: "Yes." Wife: "What do you mean by that?" Etc. etc. Theme of the second morning, "Understanding how others affect communication." It starts to clear away some of the communication smoke screens.

What do you say after you say "Hi, Honey!" What do you say after you say, "How was school today?"

It's been said that "a family that prays together, stays together." The same thing might be said about a family that communicates. How does your family communicate? Do communications flow from father on down? Do they flow from father *and* mother on down? Or, is there a free exchange in both directions? The third morning session gives you the tools to examine and improve family communications. There are creative exercises, spirited friendly competition with other families and free wheeling discussions. It's great fun, and will probably be your favorite session.

"Communication, the transfer of meaning."

Snowmass' colorful and glamorous dinner spots will tempt you to stay on into the evening. But if you do, you'll miss perhaps the most exciting, stimulating and thoroughly enjoyable sessions of the three days, the optional evening discussion groups. Each evening those who wish to participate will be exposed to a special "event" such as the film "David and Lisa," an academy award winner and a classic study of beautiful communication between two emotionally disturbed children. Given the background of the day's session and the fascinating "mix" of people, these sessions are lively and dynamic.

Author of "Between Parent and Child" is guest communicator

Dr. Haim Ginott, best-selling author, will be guest communicator and resource person at the Snowmass Conference. Known through guest appearances on NBC's *Today* Show, and for his book "Between Parent and Child," he also wrote "Group Psychotherapy with Children," considered a classic in its field. Dr. Ginott is adjunct professor at New York University, Graduate Department of Psychology, and clinical professor at Adelphi University, postdoctoral program in psychotherapy. He is a member of the American Psychological Association, American Group Psychotherapy Association, and the American Academy of Psychotherapists.

"The first thing to remember is that children are not just 'kids,' they're little people."

Kids are miniature people. They have their own likes, dislikes, pleasures, pressures . . . and eventually they grow into full size people. That is why, during this three-day learning experience, children are treated as "people." Children from seven to eighteen will meet and work with smaller groups, based on their ages. Much of the same material used with parents will be employed. Teenagers are welcomed and encouraged to attend and participate in the optional evening discussions. The generation gap starts to close!

"People are the only creatures on earth who can talk themselves into trouble."

Communication is "The beginning of understanding." And with understanding comes personal and professional growth. This is a unique and unusual educational experience in that its prime objective is to help make you a more effective member of your profession through personal growth. We promise it will be the best thing to happen to your summer.

"Words don't have meaning, only people have meaning."

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COST: Because this is a family-oriented, educational experience, the per person cost is far below that of regular seminars. Costs for the course itself are:

Physician	$175
Wife	30
Each child	15

"Communication, the cause of it all."

Each day is devoted to formal sessions in the morning, afternoon free time, and an optional evening discussion program.

There are separate sessions each of the first two mornings for you, for your wife, and for your children (over 6). The third morning, families come together.

Everybody rides the chairlift to the top of the mountain for a family breakfast at spectacular Sam's Knob Restaurant. Then family members participate in communication exercises as a family unit.

The course material covered during the ladies' session is exactly the same as that of the men's. By splitting into two groups, husbands and wives are given the opportunity to meet new people and gain new experiences independently, then share their new experiences and new friends during the afternoon free time periods. And in so doing, the fun and excitement of the communication process begins.

Share your afternoons on the golf course with new friends, enjoy a nature hike in the mountains with your family, or perhaps pack a couple of families into jeeps and head for a picnic and some of the magnificent scenery of the high country. It's all part of the total learning climate created at Snowmass-at-Aspen.

For more information, including complete particulars on the course, Snowmass activities, and economical lodge and condominium rates, fill out and return the coupon below. A complete packet of registration information will be on its way within 24 hours. Act now; all registrations must be in no later than July 1, 1970.

Tax deduction of expenses.

An income tax deduction is allowed for expenses of education (including travel, meals and lodging) undertaken to maintain and improve professional skills. The small extra costs incurred for family tuition, lodging, meals would not qualify.

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Colorado Medical Society

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President-elect: Marvin E. Johnson, Denver.

Vice President: Carl W. Swartz, Pueblo.

Treasurer: Edward B. Liddle, Colorado Springs, 1971.

Constitutional Secretary: James A. Henderson, Denver.

Delegates to the American Medical Association: Kenneth C. Sawyer, Denver, Dec. 31, 1970; Gatewood Milligan, Englewood, Dec. 31, 1971; Robert E. McCurdy, Denver, Dec. 31, 1971.

Alternate Delegates to the American Medical Association: Ray G. Witham, Craig, Dec. 31, 1971; Marcia Curry, Denver, Dec. 31, 1971; Leo J. Nolan, Lakewood, Dec. 31, 1970.

Speaker, House of Delegates: Harlan B. Huskey, Grand Junction.

Vice Speaker, House of Delegates: Kenneth A. Kahn, Boulder.

Foundation Advocate: James P. Rigg, Sr., Grand Junction.

Historian: Richard W. Whitehead, Denver.

Historian Emeritus: Bradford Murphey, Denver.

Scientific Editor for Colorado and Chairman of the Editorial Board, Rocky Mountain Medical Journal: Douglas W. Macomber, Denver.

Assistant Scientific Editor for Colorado, Rocky Mountain Medical Journal: Carl H. McLauthlin, Denver.

Executive Secretary: Donald G. Derry, 1809 E. 18th Avenue, Denver, Office Telephone 399-1222 (303).

Montana Medical Association

OFFICERS—1969-70—Terms of officers and committeemen expire at the annual meeting in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Meeting.

President: Oscar A. Swenson, Kalispell

President-Elect: Richard L. Peterson, Hamilton

Vice President: John Pfaff, Jr., Great Falls

Secretary-Treasurer: John A. Newman, Butte

Assistant Secretary-Treasurer: Colvin H. Agnew, Billings

Delegate to the American Medical Association: Herbert T. Caraway, Billings

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Executive Committee: Oscar A. Swenson, Kalispell, Chairman; Colvin H. Agnew, Billings; Herbert T. Caraway, Billings; Alfred M. Fulton, Billings; Mark B. Listerud, Wolf Point; John A. Newman, Butte; Richard L. Peterson, Hamilton; John Pfaff, Jr., Great Falls; Robert W. Thometz, Butte.

Scientific Editor, Rocky Mountain Medical Journal: Warren D. Bowman, Jr., Billings

Associate Editor, Rocky Mountain Medical Journal: L. Russell Hegland, Billings

Executive Secretary: L. Russell Hegland, 1236 North 28th Street (P. O. Box 1692), Billings 59103. Office Telephone, 259-2585.

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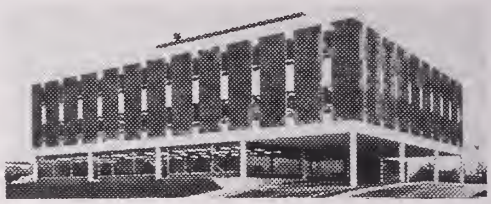

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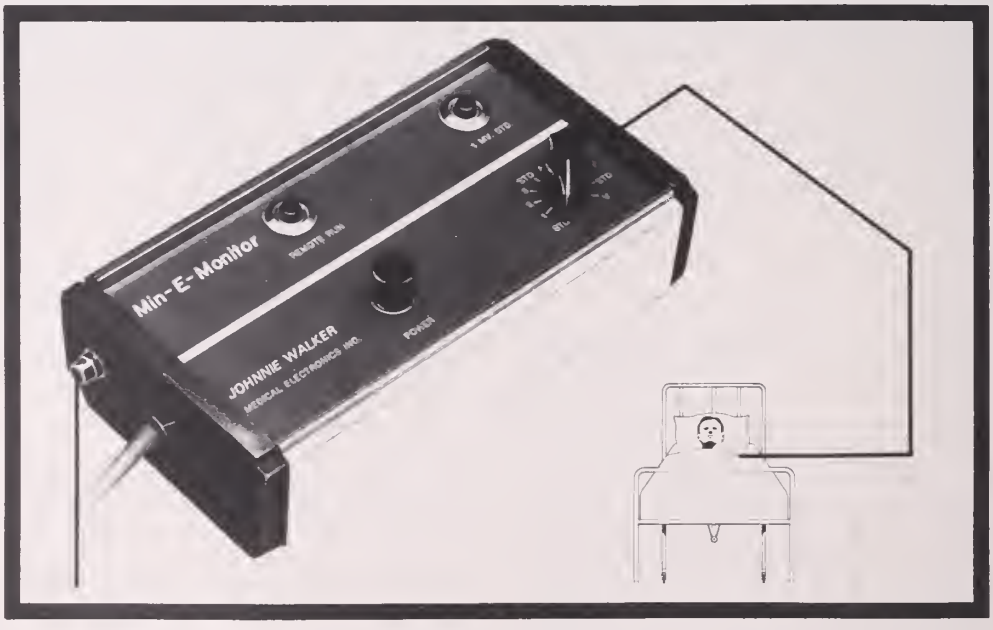

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(1) Siver, R. H.: CMD, *21*:109, September 1954. (2) Frykman, H. H.: Minn. Med., *38*:19-27, January 1955. (3) McGivney, J.: Tex. State Jour. Med., *51*:16-18, January 1955. (4) Quehl, T. M.: Jour. of Florida Acad. Gen. Prac., *15*:15-16, October 1965. (5) Weekes, D. J.: N.Y. State Jour. Med., *58*:2672-2673, August 1958. (6) Weekes, D. J.: EENT Digest, *25*:47-59, December 1963. (7) Abbott, P. L.: Jour. Oral Surg., Anes., & Hosp. Dental Serv., 310-312, July 1961. (8) Rapoport, L. and Levine, W. I.: Oral Surg., Oral Med. & Oral Path., *20*:591-593, November 1965.

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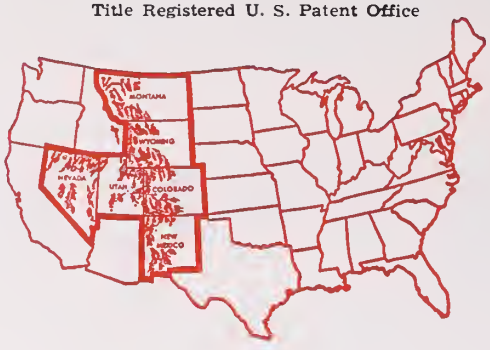

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To the Editor:*

At the last meeting of the Perinatal Mortality Committee of the Lutheran Hospital and Medical Center in Wheatridge, the matter of infant autopsies was discussed.

We are seeing a number of cases without autopsy because the attending physician is unwilling to cause further expense to the family with a funeral. This is because they require burial (minimum expense of $25.00) if an autopsy is performed.

We therefore seem to need legislation, or some loophole, that will allow us to autopsy and dispose of the remains if the family doesn't wish to have a funeral.

Thank you for whatever assistance and consideration you can give this matter.

L. R. Day, MD, Chairman
Perinatal Mortality Committee

*This letter was originally addressed to Alvin Miller, M.D., Chairman, Colorado Perinatal Mortality Committee.

To the Editor:

Re: "Perforated Diverticulitis of the Colon," Leon Sherman, MD
Arvada, Colorado
Rocky Mountain Medical Journal
April 1970, Vol. 67, No. 4

Doctor Sherman reports on the surgical management in two patients with perforated diverticulitis of the sigmoid colon utilizing simple drainage, proximal diverting colostomy, and subsequent closure of the colostomy without resection of the diseased segment of colon.

While he demonstrated that the insult in the sigmoid colon in both patients had subsided at seven and three weeks following colostomy, it is much too early to report on the successful treatment in these patients. A high rate of recurrence in complicated diverticulitis can be anticipated in the unresected segment of colon following closure of proximal colostomy.

H. U. Waggener, MD
Denver

To the Editor:

In your March 1970 issue you have an editorial about Denver Children's Hospital in which you state it serves an area coinciding with the circulation of the *Rocky Mountain Medical Journal*. "And Children's is the only hospital in the region with its own full-time pediatric-anesthesia staff."

May I call to your attention there is another pediatrics hospital in the area you indicate, namely Primary Children's Hospital in Salt Lake City, which has a full-time pediatrics-anesthesia staff of four anesthesiologists and is of an equal size to Denver Children's Hospital and serves as a regional pediatrics hospital.

William S. Jordan, MD,
Chief,
Pediatrics-Anesthesiology Section
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Salt Lake City

The best way to break a bad habit is to replace it with a good one, and this takes time, thought, and effort. Incentive and desire are good, but concerted effort must be exercised through positive constructive action.

Patricia Kinnaman—LISTEN
November 1969

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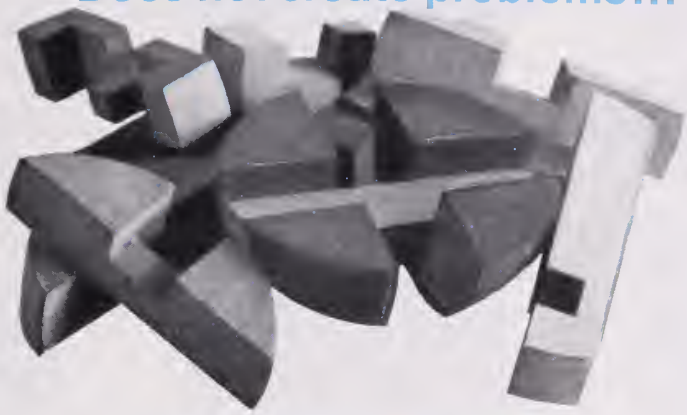

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Rocky Mountain Cancer Conference

Brown Palace Hotel — Denver, Colorado

July 17-18, 1970

Co-sponsored by the American Cancer Society, Colorado Division and the Colorado Medical Society

NO REGISTRATION FEE

Approved for AAGP Credit

Friday, July 17

8:00 a.m.—Registration

9:30 a.m.—SYMPOSIUM: **Gastrointestinal Tract Tumors**
Participants: Major General Joe M. Blumberg, M.C.U.S.A., ret; Drs. Donald S. Childs, Jr.; Alfred W. Kopf; H. Marvin Pollard; Harry W. Southwick.

12:15 p.m.—LUNCHEON
Where We're Going And Where We've Been
Guest Speaker:
Jonathan E. Rhoads, M.D.

2:00 p.m.—**Malignant Melanomas**
Major General Joe M. Blumberg

2:25 p.m.—**Results of Radiation Therapy Augmented by 5-Fluorouracil or Oxygen in the Treatment of Gastrointestinal Malignancies**
Donald S. Childs, Jr., M.D.

2:50 p.m.—**Host Defense Mechanisms in Malignant Melanomas**
Alfred E. Kopf, M.D.

3:30 p.m.—**What Is Being Done About Colon Cancer?**
H. Marvin Pollard, M.D.

3:55 p.m.—**Management of Soft Tissue Sarcomas**
Harry W. Southwick, M.D.

Saturday, July 18

8:30 a.m—Registration

9:15 a.m.—SYMPOSIUM: **Soft Tissue Cancers**
Participants: Major General Joe M. Blumberg; Drs. Donald S. Childs, Jr.; Alfred W. Kopf; H. Marvin Pollard; Harry W. Southwick.

12:15 p.m.—LUNCHEON
Changes In Medical Education
Guest Speaker:
Walter C. Bornemeier, M.D.

2:00 p.m.—INFORMATION PLEASE
Participants: Major General Joe M. Blumberg, M.C.U.S.A., ret; Drs. Donald S. Childs, Jr.; Alfred W. Kopf; H. Marvin Pollard; Harry W. Southwick.

Guest Speakers

H. Marvin Pollard, M.D.
Professor of Internal Medicine
University of Michigan
Ann Arbor, Michigan

Donald Childs, Jr., M.D.
Dept. of Therapeutic Radiology
Mayo Foundation
Rochester, Minnesota

Jonathan E. Rhoads, M.D.
Department of Surgery
University of Pennsylvania
Philadelphia, Pennsylvania

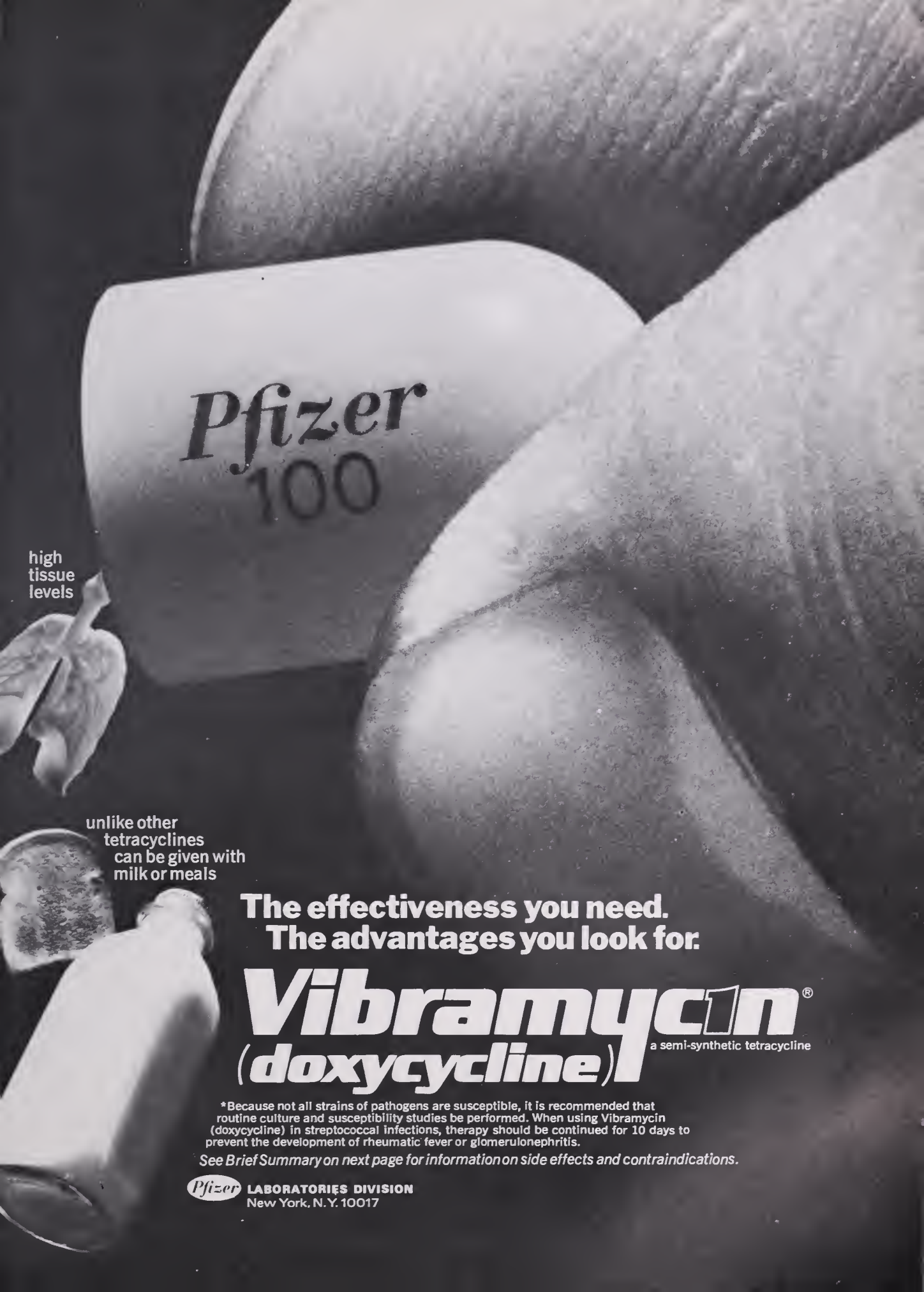
Walter C. Bornemeier, M.D.
President-elect
American Medical Association
Chicago, Illinois

Harry W. Southwick, M.D.
Department of Surgery and
President of St. Luke's Hospital
Chicago, Illinois

Alfred W. Kopf, M.D.
Professor
Department of Dermatology
New York University Med. Center
New York City, New York

Maj. Gen. Joe M. Blumberg,
M.C.U.S.A., ret.
Associate Pathologist
Oscar B. Hunter Memorial Lab.
Washington, D.C.

Pfizer
100
rapid
absorption
may surpass
tetracycline
I.M. blood
levels within
one hour
real broad spectrum,
including
susceptible strains of
Pneumococcus*
"Staph"* "Strep"*
H. influenzae*
M. pneumoniae (PPLO)*
N. gonorrhoeae*
low incidence
of diarrhea
outstanding record
of clinical success
therapeutic blood levels
usually persisting
around-the-clock
24



The effectiveness you need.
The advantages you look for.

Vibramycin® (doxycycline)

a semi-synthetic tetracycline

*Because not all strains of pathogens are susceptible, it is recommended that routine culture and susceptibility studies be performed. When using Vibramycin (doxycycline) in streptococcal infections, therapy should be continued for 10 days to prevent the development of rheumatic fever or glomerulonephritis.

See Brief Summary on next page for information on side effects and contraindications.

Pfizer LABORATORIES DIVISION
New York, N.Y. 10017

and convenience too.

The unique new Vibramycin (doxycycline) V-Pak is especially convenient for use both in your office practice and in the hospital outpatient department. It contains a typical four-day course of therapy for routine infections with easy-to-understand patien instructions. The dosage is low, just 100 mg. b.i.d. the first day followed by 100 mg. once a day for the next three days. In more severe infections, 100 mg. q.12 h. is recommended. If renal impairment exists, lower than usual doses are indicated.

And for added convenience in the hospital pharmacy, Vibramycin is available in unit-dose packs of 100 (10 x 10's) for both the 100 mg. and the 50 mg. capsules.

VIBRAMYCIN® (doxycycline)
BRIEF SUMMARY

Contraindicated: In individuals who have shown hypersensitivity to doxycycline.

Warnings: The usual dosage and frequency of administration of Vibramycin (doxycycline) differs from those of other tetracyclines. Exceeding the recommended dosage may result in an increased incidence of side effects.

If renal impairment exists, even usual doses may lead to excessive accumulation of the drug and possible hepatic toxicity. For such patients, lower than usual doses are indicated and, if treatment is prolonged, Vibramycin serum level determinations may be advisable.

Vibramycin, like other tetracyclines, may form a stable calcium complex in any bone-forming tissue, although *in vitro* Vibramycin binds calcium less strongly than other tetracyclines. The use of Vibramycin during tooth development (last trimester of pregnancy, neonatal period, and early childhood) may cause discoloration of the teeth (yellow-gray-brownish). This effect may occur mostly during long-term use, but also may occur with short-treatment courses.

Increased intracranial pressure with bulging fontanelles has been observed in infants receiving tetracyclines. This effect has disappeared rapidly on cessation of therapy with no sequelae.

In certain hypersensitive individuals treated with Vibramycin, exposure to direct sunlight may precipitate a photodynamic reaction. In individuals with a history of photoallergic reactions to tetracyclines, exposure to direct sunlight should be avoided and treatment should be discontinued at first evidence of skin discomfort.

Precautions: As with any antibiotic, overgrowth of nonsusceptible organisms may occasionally occur. Constant observation of the patient is essential. If such superinfections are encountered, Vibramycin should be discontinued and replaced by appropriate therapy.

When treating gonorrhea in which lesions of primary or secondary syphilis are suspected, proper diagnostic procedures, including darkfield examinations, should be utilized. In all cases in which concomitant syphilis is suspected, monthly serological tests should be made for at least four months.

Adverse Reactions: Nausea, vomiting, diarrhea, vaginitis, as well as reactions of an allergic nature such as dermatitis, urticaria, and anaphylaxis may occur but are rare. Glossitis, stomatitis, proctitis, onychoiysis and discoloration of the nails may rarely occur during tetracycline therapy as with other antibiotics. If severe adverse reactions, individual idiosyncrasy, or allergy occur, discontinue medication.

As with other tetracyclines, elevation of SGOT or SGPT values, or elevated BUN have been reported, the significance of which is not known at this time. Anemia, neutropenia, and eosinophilia have been reported, as with other tetracyclines.

Animal Pharmacology: As with other tetracyclines, at doses greater than those recommended for human usage, Vibramycin produces discoloration of animal thyroid glands. Careful monitoring of animals and humans has disclosed no abnormalities of thyroid function studies. Also, as with other tetracyclines, at relatively high oral doses, evidence of hepatotoxicity has been noted in dogs and signs of gastrointestinal intolerance have been seen in both dogs and monkeys.

Dosage: The usual dose of Vibramycin is 200 mg. on the first day of treatment (administered 100 mg. every 12 hours) followed by a maintenance dose of 100 mg./day. The maintenance dose may be administered as a single dose, or as 50 mg. every 12 hours. In the management of more severe infections (particularly chronic infections of the urinary tract), 100 mg. every 12 hours is recommended. The recommended dosage schedule for children weighing 100 pounds or less is 2 mg./lb. of body weight divided into two doses on the first day of treatment, followed by 1 mg./lb. of body weight given as a single daily dose or divided into doses, on subsequent days. For more severe infections up to 2 mg./lb. of body weight m be used. For children over 100 lbs. the usua adult dose should be used.

Acute gonococcal anterior urethritis in mal —a single dose of 300 mg. or 100 mg. b.i.d. for 2-4 days.

Acute gonococcal infections in the adult fem should be treated with doses of 100 mg. b.i. until cure is effected.

Therapy should be continued beyond the tim that symptoms and fever have subsided. When used in streptococcal infections, thera should be continued for 10 days to prevent the development of rheumatic fever or glomerulonephritis.

If gastric irritation occurs, it is recommende that Vibramycin be given with food or milk. Studies indicate that the absorption of Vibramycin is not markedly influenced by simultaneous ingestion of food or milk.

Simultaneous administration of aluminum h droxide gel given with tetracycline antibiotic including Vibramycin has been shown to decrease absorption.

Supply: Vibramycin Hyclate (doxycycline hyclate) is available as capsules containing doxycycline hyclate equivalent to 50 mg. of doxycycline, bottles of 50, unit-dose pack of 100 (10 x 10's), and X pack of 50 (5 x 10's); capsules containing doxycycline hyclate equivalent to 100 mg. of doxycycline, bottles of 50, unit-dose pack of 100 (10 x 10's and V pack of 25 (5 x 5's).

Vibramycin Monohydrate (doxycycline monohydrate) is available as a dry powder for oral suspension containing when reconstituted doxycycline monohydrate equivalent to 25 m of doxycycline per 5 cc. (each teaspoonful), with a pleasant-tasting raspberry flavor, 2 oz bottles.

More detailed professional information available on request.

Pfizer LABORATORIES DIVISION
New York, N.Y. 10017

Vibramycin®
(doxycycline)
a semi-synthetic tetracycline

Picture of torticollis

treated with Parafon Forte® TABLETS

Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility . . . stop pain-spasm feedback

by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

Contraindications: Sensitivity to either component. ***Precautions:*** Exercise caution in patients with known allergies or history of drug allergies. If a sensitivity reaction or signs or symptoms suggestive of liver dysfunction are observed, the drug should be stopped. ***Adverse Reactions:*** Occasionally, drowsiness, dizziness, lightheadedness, malaise, overstimulation or gastrointestinal disturbances may be noted; rarely, allergic-type skin rashes, petechiae, ecchymoses, angioneurotic edema or anaphylactic reactions. In rare instances, *Paraflex* (chlorzoxazone) may possibly have been associated with gastrointestinal bleeding. While *Paraflex* (chlorzoxazone) and chlorzoxazone-containing products have been suspected as being the cause of hepatic toxicity in approximately eighteen patients, it was not possible to state that the dysfunction was or was not drug induced. ***Usual Adult Dosage:*** Two tablets q.i.d. ***Supplied:*** Scored, light green tablets, imprinted "McNEIL"—bottles of 100.

References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

McNEIL

McNEIL LABORATORIES, INC., FT. WASHINGTON, PA. 19034

*U.S. PATENT NO. 2,895,877

Electromyographic evidence of muscle relaxation

In patients with nerve root pressure syndromes, cervical and low back strains, osteoarthritis, and fibromyositis, one of the important objectives is relief of the painful muscle spasms which can become self-perpetuating and hinder further therapy. The effectiveness of Valium® (diazepam) as a skeletal muscle relaxant was demonstrated in a controlled electromyographic study that compared the muscle relaxant effects of Valium and a placebo in 20 patients.*

With needle electrodes placed in the patients' fibrositic nodules (the so-called "trigger areas"), EMG recordings were made prior to and 15 to 20 minutes after an intramuscular injection of 1 ml (5 mg) Valium or placebo. Patients were then placed on oral Valium, 2 mg *t.i.d.* for one week, after which EMG tracings were again recorded.

Muscle relaxation was evident from the EMG patterns in all cases after Valium was injected. After 15-20 minutes, marked reduction of electrical activity was demonstrated by a lesser number of motor unit discharges and lower voltage. Observations for up to an hour following placebo administration showed no significant change in the electrical activity. EMG tracings after a week of oral Valium were approximately the same as those following parenteral administration.

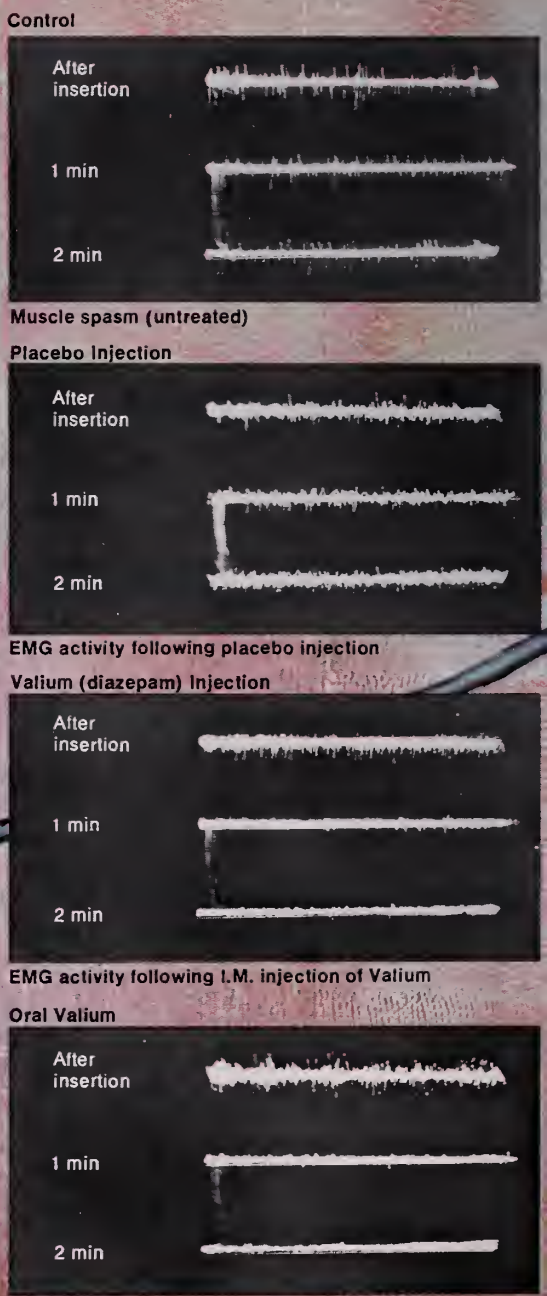
Patients' subjective responses correlate well with EMG findings

The patients' reports of decreased tenderness of the affected muscles and increased mobility of the involved muscle groups generally correlated well with the objective evidence of muscle relaxation effected by Valium.

*Arroyo, P., Jr.: *J. Florida Med. Assoc.*, *53*:29, 1966.

Please see last page of this advertisement for prescribing information.

Artist's concept of voluntary muscle with motor end plates and spindle.



Electromyograms of the effect of Valium vs. placebo upon reflex muscle spasm. First tracing in each myogram was recorded after electrode needle insertion. Photographs were taken, using triple exposures, by electrically shifting the oscilloscope baseline.

—Adapted from Arroyo, P., Jr.*

Valium® (diazepam)
to help break the spasm-pain cycle
in skeletal muscle spasm

Valium® (diazepam)

Effective skeletal muscle relaxant... useful adjunct in total management of musculoskeletal disorders

Helps increase range of mobility, thus facilitating return to more normal activity

For relief of psychic tension, often a significant and complicating factor in musculoskeletal disorders

Prompt onset of action

Generally well tolerated: most common side effects—drowsiness, fatigue, ataxia

Flexible dosage

An *h.s.* dose facilitates sleep in tension-induced insomnia

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome. Injectable form may also be used adjunctively in status epilepticus and severe recurrent seizures; anxiety prior to gastroscopy, esophagoscopy, and surgical procedures; cardioversion (I.V.); tetanus.

Contraindications: Use of Injectable in infants and tablets in children under 6 months of age; known hypersensitivity to drug; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: *Tablets:* Not of value in treatment of psychotic patients, and should not be employed in lieu of appropriate treatment. As with most CNS-acting drugs, caution patients against hazardous occupations requiring complete mental alertness (*e.g.,* operating machinery, driving). When using oral adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may also be associated with temporary increase in frequency and/or severity of seizures. Advise patients against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance. Keep addiction-prone individuals (such as drug addicts or alcoholics) under careful surveillance because of their predisposition to habituation and dependence. Use of any drug in pregnancy, lactation or in women of childbearing age requires that potential benefit be weighed against possible hazard. *Injectable:* I.V. should be injected slowly, directly into vein, taking at least one minute for each 5 mg (1 ml) given; do not mix or dilute with other solutions or drugs; do not add to I.V. fluids. Rare report of apnea or cardiac arrest noted usually following I.V. administration, especially in elderly or very ill and those with limited pulmonary reserve; duration is brief; resuscitative facilities should be available. Not recommended as the sole treatment for psychotic or severely depressed patients; should not be administered to patients in shock, coma, or in acute alcoholic intoxication with depression of vital signs.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of Valium such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants. Employ usual precautions in the severely depressed or in those with latent depression; suicidal tendencies may be present and protective measures necessary. Observe usual precautions in impaired renal or hepatic function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed or tolerated). *Injectable:* Not recommended for bronchoscopy, laryngoscopy, obstetrical use, or in diagnostic procedures other than gastroscopy and esophagoscopy; laryngospasm is a possible reaction during gastroscopy and necessary countermeasures should be available; drug has produced hypotension or muscular weakness particularly when used with narcotics, barbiturates or alcohol; since effect with narcotics may be additive, appropriate reduction in narcotic dosage is possible; use lower doses (2 to 5 mg) for elderly and debilitated; safety and efficacy in children under 12 not established.

Adverse Reactions: Side effects most commonly reported: drowsiness, fatigue and ataxia. Infrequently encountered: confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo and blurred vision; with Injectable, hiccups, hypoactivity, phlebitis at injection site, syncope and urticaria. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances and stimulation have been reported; should these occur, use of the drug should be discontinued. Because of isolated reports of neutropenia and jaundice, periodic blood counts and liver function tests are advisable during long-term therapy. Minor changes in EEG patterns (low-voltage fast activity) observed during and after therapy and are of no known significance.

Dosage: Individualize for maximum beneficial effect. ORAL—*Adults:* Tension, anxiety and psychoneurotic states, 2 to 10 mg b.i.d. to q.i.d.; alcoholism, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; adjunctively in skeletal muscle spasm, 2 to 10 mg t.i.d. or q.i.d.; adjunctively in convulsive disorders, 2 to 10 mg b.i.d. to q.i.d. *Geriatric or debilitated patients:* 2 to 2½ mg, 1 or 2 times daily initially, increasing as needed and tolerated. (See Precautions.) *Children:* 1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use under 6 months). INJECTABLE—Usual initial adult dose is 2 to 10 mg I.M. or I.V., depending on indication for use. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Precautions and Adverse Reactions.) In gastroscopy and esophagoscopy, 5 to 10 mg I.M. or I.V., 30 minutes prior to procedure. As preoperative medication, 10 mg, I.M., 1 to 2 hours before surgery. In cardioversion, 5 to 15 mg, I.V., within 5 to 10 minutes prior to procedure. Give I.V. injections slowly; take at least 1 minute for each 5 mg (1 ml).

In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory; not more than 30 mg should be given within 8-hour period. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Supplied: Valium® (diazepam) Tablets, 2 mg, 5 mg and 10 mg; bottles of 100 and 500. All Strengths also available in Tel-E-Dose™ packages of 1000. Valium® (diazepam) Ampuls, 2 ml; boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.

ROCHE
Roche
LABORATORIES
Division of Hoffmann-La Roche Inc
Nutley, New Jersey 07110

IN ASTHMA
IN EMPHYSEMA

optional therapy

THE mudranes

All Mudranes are bronchodilator-mucolytic in action, and are indicated for symptomatic relief of bronchial asthma, emphysema, bronchiectasis and chronic bronchitis. **MUDRANE tablets** contain 195 mg. potassium iodide; 130 mg. aminophylline; 21 mg. phenobarbital (Warning: may be habit-forming); 16 mg. ephedrine HCl. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline-phenobarbital-ephedrine combinations. **Iodide side-effects:** May cause nausea. Very long use may cause goiter. Discontinue if symptoms of iodism develop. **Iodide contraindications:** Tuberculosis; pregnancy (to protect the fetus against possible depression of thyroid activity). **MUDRANE-2 tablets** contain 195 mg. potassium iodide; 130 mg. aminophylline. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline. **Iodide side-effects and contraindications are listed above. MUDRANE GG tablets** contain 100 mg. glyceryl guaiacolate; 130 mg. aminophylline; 21 mg. phenobarbital (Warning: may be habit-forming); 16 mg. ephedrine HCl. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions** are those for aminophylline-phenobarbital-ephedrine combinations. **MUDRANE GG-2 tablets** contain 100 mg. glyceryl guaiacolate; 130 mg. aminophylline. **Dosage** is one tablet with full glass of water, 3 or 4 times a day. **Precautions:** Those for aminophylline. **MUDRANE GG Elixir.** Each teaspoonful (5 cc) contains 26 mg. glyceryl guaiacolate; 20 mg. theophylline; 5.4 mg. phenobarbital (Warning: may be habit-forming); 4 mg. ephedrine HCl. **Dosage:** Children, 1 cc for each 10 lbs. of body weight; one teaspoonful (5 cc) for a 50 lb. child. Dose may be repeated 3 or 4 times a day. Adult, one tablespoonful, 4 times daily. All doses should be followed with ½ to full glass of water. **Precautions:** See those listed above for Mudrane GG tablets.

MUDRANE—original formula
First choice

MUDRANE-2
When ephedrine is too exciting or is contraindicated

MUDRANE GG
During pregnancy or when K.I. is contraindicated or not tolerated

MUDRANE GG-2
A counterpart for Mudrane-2

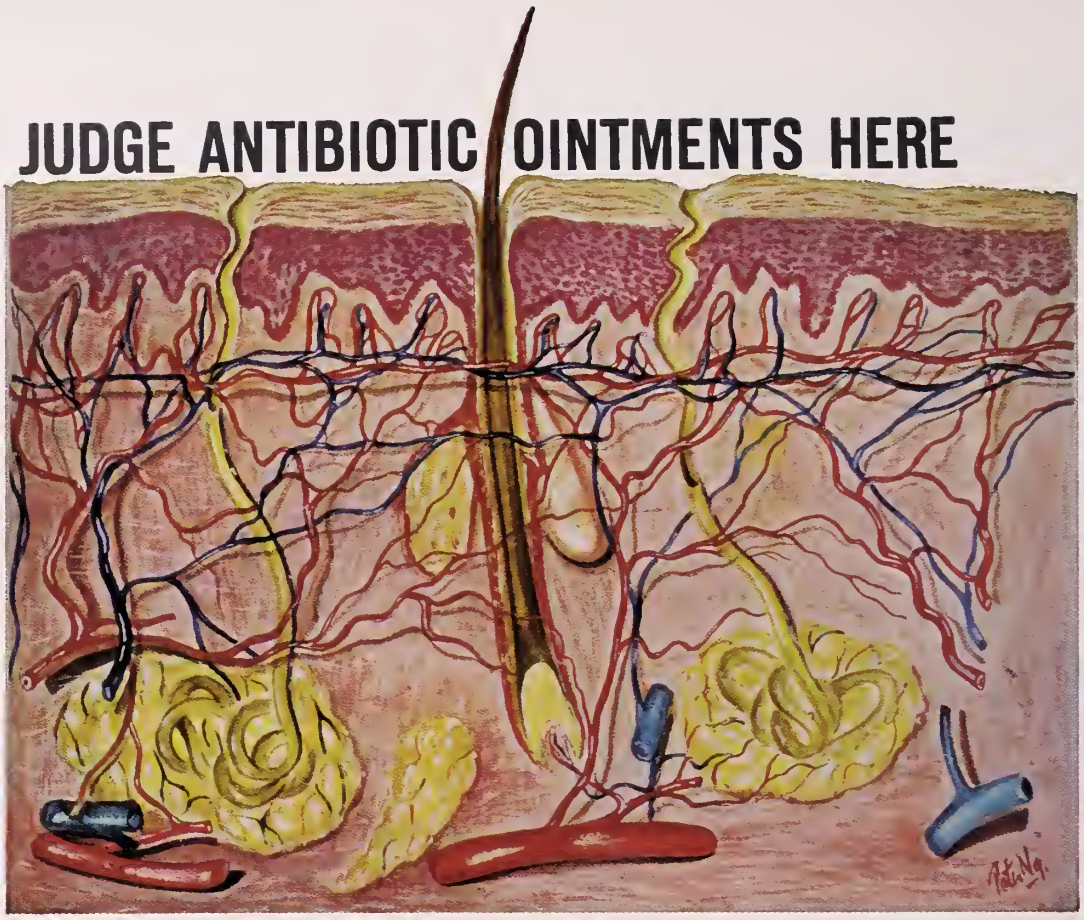
MUDRANE GG ELIXIR
For pediatric use or where liquids are preferred

Clinical specimens available to physicians.

WILLIAM P. POYTHRESS & COMPANY, INC., RICHMOND, VIRGINIA 23217

Manufacturers of Ethical Pharmaceuticals

JUDGE ANTIBIOTIC OINTMENTS HERE



Results on skin are final proof of any topical antibiotic's effectiveness

No in vitro test can duplicate a clinical situation on living skin. 'Neosporin' (polymyxin B—bacitracin—neomycin) Ointment has consistently proven its effectiveness in thousands of cases of bacterial skin infection. The spectra of the three antibiotics overlap in such a way as to provide bactericidal action against most pathogenic bacteria likely to be found topically. Diffusion of the antibiotics from the special petrolatum base is rapid since they are insoluble in the petrolatum, but readily soluble in tissue fluids. The Ointment is bland and nonirritating.

Caution: As with other antibiotic preparations, prolonged use may result in overgrowth of nonsusceptible organisms and/or fungi. Appropriate measures should be taken if this occurs. Articles in the current medical literature indicate an increase in the prevalence of persons allergic to neomycin. The possibility of such a reaction should be borne in mind.

Contraindications: This product is contraindicated in those individuals who have shown hypersensitivity to any of its components.

Supplied: Tubes of 1 oz., ½ oz. with applicator tip, and ⅛ oz. with ophthalmic tip.

Complete literature available on request from Professional Services Dept. PML.

'NEOSPORIN'®

brand

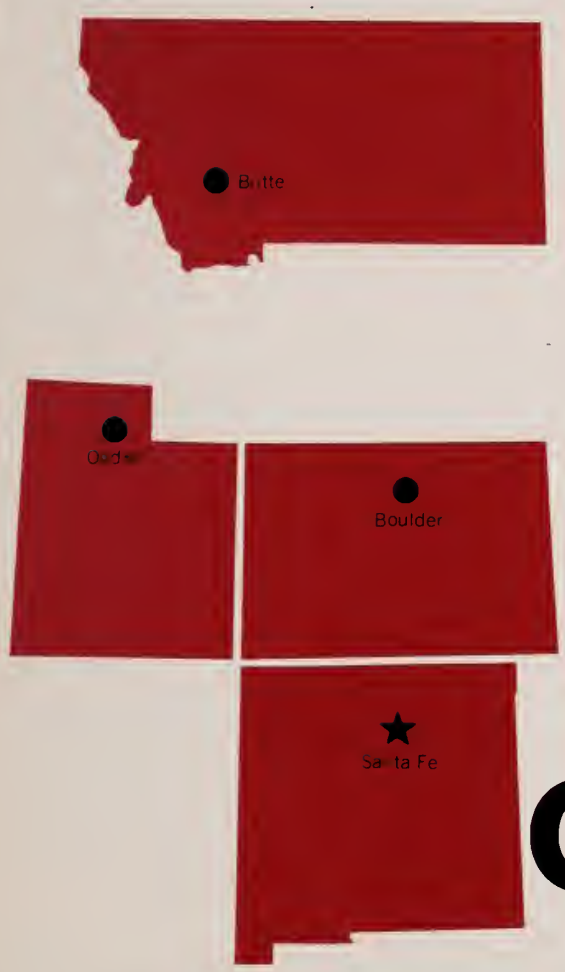
POLYMYXIN B-BACITRACIN-NEOMYCIN OINTMENT

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N.Y.

Schering

After only one year:

Administered to more people than live in Boulder, Ogden, Butte, and Santa Fe.*



Injectable
Garamycin®
brand of
gentamicin sulfate
injection

*An estimated 208,000 patients have received GARAMYCIN Injectable to date. The combined population of Boulder, Ogden, Butte, and Santa Fe is 200,000. (Estimated 1969 figures from The New York Times Encyclopedic Almanac 1970.)

See Clinical Considerations section on last page...

Mounting acceptance in the hospital...

Proven clinical effectiveness

Respiratory Infections

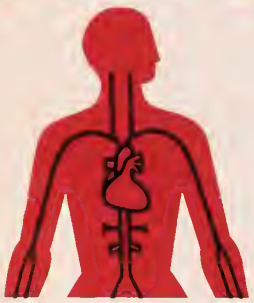
Outstanding results in serious gram-negative respiratory infections[1,2]

GARAMYCIN Injectable may prove successful where other antibiotics have failed.

Urinary Tract Infections

Strikingly effective in selected urinary tract infections[3]

With relatively low intramuscular doses, the promptly attained levels of GARAMYCIN achieved in the urine are considerably higher than the concentrations required for effectiveness against virtually all susceptible gram-negative pathogens. (Appropriate precautions are indicated in patients with impaired renal function; consult Package Insert for full details.)



Septicemia

May be lifesaving[4-6]

Numerous investigators have drawn attention to the value of GARAMYCIN Injectable in the treatment of gram-negative septicemias, often complicated by shock. Many hospital strains of *Serratia* are susceptible.[6]

Wounds and Burns

Response may be dramatic in wounds and burns complicated by sepsis[7]

The established efficacy of GARAMYCIN Injectable against *Pseudomonas*—as well as most other gram-negative pathogens—makes it an especially useful agent in the treatment of infected wounds and burns.

Important Precautionary Note Patients receiving treatment with GARAMYCIN Injectable (gentamicin sulfate injection) should be under close clinical observation because of the toxicity associated with the use of the drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those with preexisting renal damage, treated with GARAMYCIN Injectable for longer periods or with higher doses than recommended.

GARAMYCIN Injectable is potentially nephrotoxic, and this should be kept in mind when it is used in patients with preexisting renal damage.

This drug should be limited to the treatment of serious infections caused by susceptible gram-negative bacteria, with due regard for relative antibiotic toxicity. (See Clinical Considerations section.)

Mounting evidence in the laboratory...

Schering

Over 95% gram-negative pathogens sensitive.*

No other antibiotic performed comparably *in vitro* against gram-negative pathogens.
In a nationwide culture audit of antibiotic sensitivity patterns, sensitivity reports from 106 hospitals, geographically representative by census tract and of varying sizes, were analyzed. During the three-month period, ***every*** gram-negative culture slip from ***every*** hospital was surveyed. The total number of cultures involved in the audit was 97,091. The total number of sensitivity determinations was 643,503.

Pathogens	Percentage of sensitive strains Number of strains tested Antibiotics*							
	Garamycin	Kanamycin	Cephalothin	Cephaloridine	Ampicillin	Colistimethate	Chloramphenicol	Tetracycline
Klebsiella pneumoniae	99.5% 962	84.7% 992	86.2% 995	76.1% 67	32.7% 1,020	96.3% 640	82.9% 1,028	77.1% 1,026
Aerobacter aerogenes	95.9% 2,739	86.1% 2,818	53.5% 2,985	58.8% 1,514	22.7% 3,066	88.6% 2,603	85.8% 3,071	67.8% 2,981
Klebsiella aerobacter group	98.8% 566	83.9% 547	66.1% 522	60.5% 276	28.0% 553	89.5% 560	86.2% 587	62.8% 433
Klebsiella, all others	92.7% 2,944	83.3% 3,186	77.4% 2,976	67.5% 627	13.5% 2,883	95.0% 2,105	81.6% 3,212	70.6% 3,063
Pseudomonas aeruginosa	91.6% 4,528	29.8% 4,460	6.6% 4,418	6.6% 1,279	6.0% 4,360	91.3% 3,852	26.9% 4,608	26.4% 4,404
Proteus, indole-positive	91.8% 1,031	85.8% 1,062	39.9% 981	54.1% 364	40.2% 1,042	10.3% 758	76.1% 1,096	42.1% 1,051
Proteus mirabilis, indole-negative	94.9% 3,272	90.1% 3,378	83.1% 3,290	77.5% 975	78.0% 3,274	8.8% 2,634	85.9% 3,469	26.8% 3,278
Proteus, unspecified	96.2% 1,335	85.8% 1,371	71.7% 1,434	70.0% 647	64.7% 1,435	11.2% 1,233	76.0% 1,421	22.4% 1,298
Escherichia coli and all other *Escherichias*	96.4% 12,557	91.4% 12,818	87.8% 12,686	88.8% 4,251	74.6% 12,899	95.4% 10,623	94.1% 13,086	70.0% 12,559
Paracolobactrum, all	93.4% 303	88.9% 325	62.0% 305	74.2% 62	43.8% 340	80.9% 215	87.1% 350	72.6% 340
Coliform bacteria	99.0% 593	91.2% 649	81.5% 637	66.7% 21	52.7% 624	95.6% 607	91.6% 678	76.1% 637
Totals	95.1% 30,830	80.5% 31,606	65.3% 31,229	68.1% 10,083	50.3% 31,496	75.8% 25,829	79.7% 32,606	56.5% 31,070
Gram-positive (included for consistency with Package Insert, not an approved indication)								
Staph—*S. aureus, coagulase-positive*	97.4% 1,548	88.8% 1,458	97.7% 2,050	98.7% 636	61.1% 1,559	20.4% 628	94.4% 2,123	83.7% 1,966
Staph—*S. aureus,* unspecified	99.3% 993	92.8% 902	98.1% 1,289	95.3% 213	45.8% 1,153	29.3% 116	96.4% 1,427	82.3% 1,360

*Adapted from a three-month, nationwide hospital audit by R. A. Gosselin and Co., Inc., Dedham, Massachusetts (mid-May to mid-August,1969).[5]
Antibiotics with significant gram-negative spectra are included. Organisms are listed as reported by laboratory.
Sensitivity testing was done by the disc method, a generally reliable test in the hospital setting. It should be noted, however, that the results with GARAMYCIN were somewhat higher than the results reported where the tube dilution technique was used. (See Clinical Considerations section which follows.) The concentration of the GARAMYCIN disc was 10 mcg.
Whereas standard testing methods were used by all hospitals, it is acknowledged that in a survey of this kind considerations such as differences in methodology are possible sources of error. The comparative percentage-sensitivity results derived from a survey of this kind are, therefore, not absolute. One should keep in mind also that the proper selection of an antibiotic is based not only on susceptibility testing but on relative toxicity and other clinical considerations as well.
It is felt, nonetheless, that the broad scope of the survey and the extreme care in data collection and tabulation permit a conclusion that the results are *generally* representative of current nationwide antibiotic sensitivity patterns.

Injectable Garamycin®
brand of gentamicin sulfate injection

See Clinical Considerations section on last page...

Injectable Garamycin®

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Schering

ADULT DOSAGE GUIDELINES

See definitive prescribing information in Package Insert.

Patients with Normal Renal Function

Total Daily Dose (administered in two, three, or four divided doses)			
	Less Severe	**Resistant/ Moderately Severe**	**Serious/Life-Threatening**
Urinary Tract Infections (due to susceptible strains of gram-negative bacteria)†	0.8-1.2 mg./kg. for 7-10 days	Larger doses or additional antibacterial therapy should be considered in severe urinary tract infections or in resistant cases involving the renal parenchyma or anatomic anomaly.	up to 5 mg./kg.
Other Infections including bacteremia, infected surgical wounds, severe soft tissue infections, and respiratory tract infections (due to susceptible strains of gram-negative bacteria)	3 mg./kg. for 7-10 days		

†Alkalinization of the urine may be a useful therapeutic adjunct.

Patients with Impaired Renal Function

To minimize the risk of ototoxicity in patients with impaired kidney function, only the first dose should be that normally recommended. Each subsequent dose should be half or less of that recommended for patients with normal renal function, depending upon the degree of renal impairment.

In patients with renal failure who are undergoing 14-hour hemodialysis twice weekly, administration of 1 mg./kg. GARAMYCIN Injectable at the end of each dialysis period has been suggested.

Clinical Considerations

Indications: GARAMYCIN Injectable is clinically effective in infections due to susceptible strains of gram-negative bacteria, including *Pseudomonas aeruginosa,* and species of indole-positive and indole-negative *Proteus, Escherichia coli,* and *Klebsiella-Aerobacter.* Bacteriologic studies should be conducted to identify the causative organism and to determine its sensitivity to gentamicin sulfate. Sensitivity discs of the drug are available for this purpose. If the susceptibility tests indicate that the causative organism is resistant to gentamicin sulfate, other appropriate antibiotic therapy should be instituted.

IN VITRO INHIBITION OF CLINICALLY IMPORTANT BACTERIA BY GENTAMICIN SULFATE (TUBE DILUTION STUDIES)

BACTERIA	No. of Strains Tested	No. of Strains (%) Inhibited by: 4 mcg./cc. or less		8 mcg./cc. or less*		No. of *In Vitro* Studies
Staphylococcus aureus	1,210	1,200	(99%)	1,206	(99%)	11
Pseudomonas aeruginosa	885	771	(87%)	828	(93%)	16
Escherichia coli	836	736	(88%)	779	(93%)	11
Indole-positive and indole-negative *Proteus* species	477	210	(44%)	358	(75%)	12
Klebsiella-Aerobacter species	292	205	(70%)	231	(79%)	10

*Number of strains (%) of gram-negative bacteria inhibited by 10 mcg./cc. or less are as follows: *Pseudomonas aeruginosa,* 828 (93%); *Escherichia coli,* 792 (95%); *Proteus* species, 393 (82%); *Klebsiella-Aerobacter* species, 284 (97%). From same studies as above.
Source: Package Insert

This drug should be limited to the treatment of serious infections caused by gram-negative bacteria, particularly *Pseudomonas aeruginosa, Proteus* and other susceptible organisms, with due regard for relative antibiotic toxicity. Therefore, the drug should be considered for use against gram-negative: 1. Bacteremia; 2. Infected surgical wounds; 3. Severe soft tissue infections, including burns complicated by sepsis; 4. Respiratory tract infections; and 5. Selected cases of urinary tract infection.

Contraindications: GARAMYCIN Injectable is contraindicated in individuals with a history of hypersensitivity or toxic reactions to gentamicin.

Warnings: Patients receiving treatment with GARAMYCIN should be under close clinical observation because of the toxicity associated with the use of this drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those with pre-existing renal damage, treated with GARAMYCIN Injectable, usually for longer periods or with higher doses than recommended.

GARAMYCIN Injectable is potentially nephrotoxic, and this should be kept in mind when it is used in patients with pre-existing renal impairment. Kidney function diminished by infection of the upper urinary tract may, however, improve during effective treatment with GARAMYCIN Injectable.

Concurrent administration of potentially ototoxic drugs such as streptomycin and kanamycin or of potentially nephrotoxic drugs such as polymyxin, colistin, and kanamycin with gentamicin sulfate has not been shown to afford any clinical advantages and, moreover may result in additive toxicity. Monitoring of vestibular, cochlear, and renal function will provide guidance for therapy in such cases.

Precautions: In patients with impaired renal function in whom serious infection develops, serum concentrations of the drug may rise, with consequently increased risk of ototoxicity. In these patients or in those in whom recommended dosage or duration of therapy must be exceeded as a life-saving measure, routine studies of kidney function should be performed when possible. These may be supplemented by evaluation of the vestibular and auditory function and measurement of serum concentration of the drug when feasible. Serum concentrations of gentamicin should be maintained below the range of 10-12 mcg./ml. to reduce risk of ototoxicity.

Ordinarily, treatment should not be given for more than 7 to 10 days or be repeated unless required for serious infection not responsive to other agents.

As with other antibiotics, treatment with GARAMYCIN Injectable may occasionally result in overgrowth of nonsensitive organisms. If superinfection occurs, appropriate therapy is indicated.

Safety for use in pregnancy or the potential for fetal ototoxicity or nephrotoxicity have not been established. Studies in pregnant animals have not revealed teratogenic or ototoxic effects in the fetus. GARAMYCIN Injectable should not be used in pregnant patients or in women of childbearing age unless its use is deemed advisable by the physician.

Adverse Reactions: The overall incidence of ototoxicity considered related to treatment with GARAMYCIN Injectable was 2.8 per cent (16 of 565 patients). Contributory factors (two or more factors were relevant to most patients) were as follows: 10 had azotemia, 10 received a total of 1 gram or more of the drug, 7 had recently received other potentially ototoxic antibiotics (streptomycin or kanamycin), and 5 were over 60 years of age. Six also had decreased high-tone hearing acuity, which returned to or toward normal in the 4 patients retested.

Analysis of BUN data indicated that 4 (2%) of 172 patients showed increases in BUN that were probably related to treatment with GARAMYCIN Injectable. Of 20 increases probably or possibly related to treatment, 7 were reversible, 9 occurred in terminal patients, and 4 had no follow-up.

Other adverse reactions associated with treatment were one instance each of urticaria, decreased hematocrit, and reversible depression of granulocytes with normal bone marrow. Other rarely reported and possibly treatment-related adverse reactions were anemia, increased reticulocyte count, rash, purpura, drug fever, hypotension, convulsions, twitching, salivation, nausea, vomiting, increased transaminase activity (SGOT or SGPT), increased serum bilirubin, decreased serum calcium, and joint pain.

Packaging: GARAMYCIN Injectable, 40 mg./cc., 2-cc. multiple-dose vials, for intramuscular administration.

References: (1) Brayton, R. G., and Louria, D. B.: Gentamicin in gram-negative urinary and pulmonary infections, Arch. Int. Med. *114*:205, 1964.* (2) Louria, D. B.; Young, L.; Armstrong, D., and Smith, J. K.: Gentamicin in the treatment of pulmonary infections, J. Infect. Dis. *119*:483, 1969. (3) Cox, C. E.: Gentamicin, a new aminoglycoside antibiotic: Clinical and laboratory studies in urinary tract infections, J. Infect. Dis. *119*:486, 1969. (4) Groll, E.: Clinical experience with gentamicin, data from 12 German clinics, in Gentamicin: First International Symposium, Paris, January 1967, Lucerne, Essex Chemie AG, pp. 121-128.* (5) Jackson, G. G.: Laboratory and clinical investigation of gentamicin, *ibid.*, pp. 62-74. (6) Medeiros, A. E.: Discussion, J. Infect. Dis. *119*:533, 1969. (7) Polk, H.: Discussion, J. Infect. Dis. *119*:529, 1969. (8) Three-month, nationwide hospital audit by R. A. Gosselin and Co., Inc., Dedham, Massachusetts (mid-May to mid-August, 1969).

*Dosage in this investigational study was less than now recommended in Package Insert.

For more complete prescribing details, consult package insert or Physicians' Desk Reference. Schering literature is also available from your Schering Representative or Medical Services Department, Schering Corporation, Union, New Jersey 07083.

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PRESCRIBING INFORMATION

WARNING: Do not give in advanced kidney or liver disease. PRECAUTIONS: Trocinate relaxes all smooth muscles. Large dosage or prolonged usage may cause feeling of weakness or can theoretically precipitate gall-bladder colic, due to relaxing the vascular and duct systems. Caution should be observed in patients with urinary bladder obstruction. DOSAGE: 400 mg. May be repeated in 4 hours. After relief, lengthen the dose frequency. (see side note)

NOTE: *The high therapeutic index of Trocinate permits its administration in dosage sufficient to relieve smooth muscle spasm promptly. 400 mg. dosage usually creates a therapeutic blood level. In reducing dosage after relief, lengthening the time between dosage rather than lessening the recommended dose is preferable. The prompt direct action allows a consciousness of the first suggestion of return of symptom . . . a guide to dose spacing and to determining when treatment is complete. A prescription for twelve or sixteen 400 mg. tablets will usually correct spasm and leave a few tablets for a reserve.*

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1. Who may submit articles. The Rocky Mountain Medical Journal ordinarily accepts only articles prepared by members of the state societies we serve and by guest speakers at their official meetings.

2. Method of preparation. All material for publication must be typewritten, double spaced, with liberal margins, using only one side of the paper, pages consecutively numbered, and preferably on standard 8½ x 11 white bond paper. Carbon copies are *not* acceptable.

Title (preferably short) and author's name, city and state must appear at the top of the first page. Second and subsequent pages should be identified with consecutive page numbers and author's surname. If physician authors possess more than one degree, the MD only is used. Lesser degrees of non-MD authors or co-authors may be used.

Please include beneath the title or at the top of the first page a brief paragraph stating what the article is designed to show and, therefore, why it should be read. This introductory feature is, in editorial parlance, called the "blurb"; it is printed in bold type.

3. Where to submit material. All copy must be sent to the editor for the state in which the material originates. Editors for each state, with their mailing addresses, are listed monthly on the Table of Contents page of the Journal.

4. Acceptance or rejection. The state editor will (1) tentatively accept the article, (2) return it to the author with suggestions for revision, or (3) reject it. He will edit and forward approved copy to the publication office in Denver for final editing and scheduling.

5. Order of publication. Ordinarily, articles will be published in the order received. Those whose value is seasonal, whose value would be lost if publication is delayed, or which reflect priority of original research, are given special consideration. State presidential addresses, programs, state society minutes, and timely organization announcements are given priority.

6. Length of articles. Scientific papers should be "boiled down" not to exceed ten pages of double-spaced typewritten standard 8½ x 11 inch sheets. Shorter papers are more acceptable to editors and readers, and earlier publication is probable. Every journal is in competition for the reader's time, and condensation is the order of the day. For this reason, and because of financial and space limitations, we request that copy be condensed to the greatest extent consistent with conveying the message.

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9. Case reports. Case reports are popular with our readers. A brief introductory statement concerning the condition or disease, tells why the case is presented. The report follows with a separate heading, CASE REPORT or CASE 1, CASE 2, etc. Include only relevant, positive laboratory and other data. Names, initials, and numbers are unimportant; age, sex, and sometimes occupation are significant. Minimize dates; then make it month, date, year—as February 9, 1969; not 2/9/69. After the case presentation, review or sum it up under a heading such as Discussion, Comment, Summary or Conclusion.

10. Footnotes. Footnotes must be brief. One at the bottom of the first page should state the Society and date of presentation, and institutional origin, if any. Special titles or position of the author, acknowledgements, etc., will be added according to simplicity, editorial policy and discretion.

11. References. Reference lists rarely add to the value of an article for the majority of readers. We will make every effort to publish short reference lists, but long ones will be deleted. Incidentally, the proper heading is "References," not "Bibliography." The latter implies everything in the literature upon the subject. Make them uniform in style and brief, as: Jones, W. K.: Pyelonephritis in Infancy. JAMA 141:75. 1964.

12. Editorials. We would like to have more submitted by our State editors and the membership at large. Readers must get tired of thunder from publication headquarters in Denver; frankly, we do too! Speak out, and we'll sign your name, initials, or respect your request for anonymity, as you choose. If you don't like something we do or say, please let us in on it; we could even stand to hear about it if something happens to please you. A "Letter to the Editor" may help you get something off your mind. We're asking for it and we have a place to put it—in the Journal, that is!

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Don't Get Sick In America

We did not plan to repeat our criticism of television (*Rocky Mountain Medical Journal*, April 1970). However, the T.V. documentary of a few weeks ago is a perfect example of what is wrong with this medium. It was a (1) well publicized presentation (2) of a previously determined conclusion (3) with biased examples to prove this conclusion (4) beamed to a large audience (5) as an indisputable fact. In no way could this program be construed as objective reporting of news or events.

The documentary began with an example of a man who had no insurance coverage for elective herniorrhaphy—a rare, and not too wise, bird in any hospital census. A total bill of $1000, hospital and doctors, in one of the highest cost-of-living areas in the nation, was intimated to be out of reach, although it's an acceptable price for a refrigerator and color T.V. set. The analyst criticized the fact that the patient contributed in his payment for laboratory and other services toward expensive cardiac and other sophisticated hospital equipment. Apparently he was unaware that this patient might have been the very one whose life was saved by one or more of these devices.

The second example was a patient requiring repeated dialyses who could no longer afford his partial payments toward his dialysis in his community and returned to his own country, Denmark, where one is led to believe that the government has enough money to pay for dialysis of all of its citizens. It was not explained that our government does not have this kind of money because problems of the ghetto, riots, crime, urban renewal, pollution, Vietnam, space exploration, and deficit spending keep it broke. The commentator does not present his list of priorities for spending.

For one patient, $1000 is too much for a major operation; for another no cost is too much for prolonging life another year or two.

The experts on the program (who chooses the experts?) advance their opinions of the waste in our system of delivery of health care. Overlapping facilities are glibly presented as novel ideas with no reference to medicine's long awareness of the problem and recent positive actions. The taped interview of the president of the A.M.A. has been cleverly edited to present him as the epitome of organized medicine's response to the problem of cost of medical care—aloof, undecided, static.

If you saw the program you recall other biased half truths, rebuttal of which cannot be set forth in a short editorial. In fact, *there can be no rebuttal in the true sense*, since there is no way that you and I can respond for the benefit of the same giant audience that television serves—and *serves* is perhaps not the correct word. The frightening quotation from our previous editorial should be repeated: "for millions . . . Reality is only what appears on the tube."

The commentator concludes with a lie! "All of the countries of Western Europe have solved their problem of the high cost of medical care. Why can't the United States?" Mr. Schorr, name one! What type of medical care do you have in mind? The same quality costs about the same anywhere. Our hernia patient would have found a long waiting line in most of these countries. Moreover, the decision of who pays the cost is not the solution for the highness of the cost. But, we conclude from your presentation that you have already made up *your* mind!

A Stimulating Educational Experience for You and Your Family

"TELL IT LIKE IT IS," is the slogan of many of our young people these days. This is equally true for all of us who spend all or part of our time communicating through the written word. It is also true for our readers who occasionally learn, with dismay, that their clearly expressed ideas, instructions, or directions have failed to be understood by patients, staff members, or members of their families.

Because of this, we at our *Journal* office are excited about a new program developed in conjunction with a team of professional consultants. Tailored especially for Doctors and their families, it is called "Communication, the cause of it all." It is scheduled for August 3, 4 and 5, the first such event to be hosted by the newly created Snowmass Institute for Human Resources. Under development for nearly a year, the program is the only one of its kind in the country. As a physician aware of the latest developments in his profession, a businessman interested in new management tools, a father and husband interested in a full family life, you will find this an important conference.

"Communication, the cause of it all," was actually written by Richard Byrd and David Jones, president and vice president, respectively, of Jones and Byrd Incorporated. They will direct the staff and take active part in some phases of instruction. Among outstanding resource persons and communicators participating in the conference will be Dr. Haim Ginott, author of "Between Parent and Child." Another of his books, "Group Psychotherapy with Children," is considered a classic in its field.

A unique feature of the Snowmass Communications Conference program is the way recreational activities are integrated into it. Formal sessions are held mornings only, with afternoons free for the recreational activity of your choice. Based on the materials covered in the morning sessions, however, even the recreational activities provide learning experiences in communication. Since "Communication, the cause of it all" is an educational conference, undertaken to maintain and improve professional skills, your own expenses will be significantly reduced by an income tax deduction.

Many of our members will want to attend this exciting, three-day family learning experience in the Colorado Rockies and to make it the start of a great family vacation in our mountains. Snowmass-at-Aspen, with its magnificent scenery and vast recreational facilities, is the perfect spot for that start.

More information on Colorado Medical Society's Snowmass Communications Conference, August 3, 4, 5 can be found in a two-page summary on pages 70 and 71 of this issue. A coupon is included for requesting an information packet. We urge that you mail the coupon and plan to attend the conference. It can be the most stimulating vacation and rewarding educational experience in many a year. See you at Snowmass-at-Aspen, August 3, 4, 5!

CAMP CHIEF OURAY FOR DIABETICS

Granby, Colorado

August 11 - August 25, 1970

Diabetic boys and girls ages 7 through 15 can again attend a regular summer camp in the Rocky Mountains. Starting August 11 and lasting through August 25, 1970, the Colorado Diabetes Association, an affiliate of the Mile High United Fund, will again sponsor a camp program for young diabetics at Camp Chief Ouray which is located near Granby, Colorado, and is owned and operated by the Denver Area Y.M.C.A.

Additional information may be obtained by writing to the Colorado Diabetes Association, 1375 Delaware Street, Denver, Colorado 80204, or by calling 623-2221.

The inadequate chin

Douglas W. Macomber, MD, Denver, Colorado

When recommended with discretion and used with adequate attention to all of the principles of good surgery, chin augmentation has much to offer a large group of patients as a separate procedure or in addition to other reconstructive surgery.

THE CHIN IS A comparatively minor feature—not in the same league with the eyes, the "windows of the soul"; the nose, said to be great in great people; and the mouth with its animation. The latter may be small, big, loud, grim or tight. However, its neighbor to the south, the chin, has negligible expression, not lending itself to artistic evaluation or poetic interpretation. But it is structurally important in the lower third of the face and is either "for" or "against" the other features as a strong, weak, or indifferent element of facial symmetry and contour. This fact is commonly overlooked and escapes attention of people whose chins are not in pleasing harmony with their other features. Even the many critics of beauty and good looks—especially those whose vocations and avocations deal with art, photography, hair styling, lights and cameras—are peculiarly unmindful of the chin. Everyone seems to be age-conscious and many are nose-conscious, but seldom do we hear of chin-consciousness. This is curiously true of individuals whose features are otherwise favorable and who would be good or better looking with a becoming chin. They don't like the profile, no hair-do or hat is right, or there is more or less mental fixation on the wrong feature. Discrete discussion with such patients, after confidence is established, will engender insight and realistic perspective. Seeds of discontent are not planted and a satisfying decision will probably follow.

There are, of course, many abnormalities of the mandible and chin, some with important dental concomitance. Trauma, tumor surgery, and extreme developmental anomalies comprise a field beyond the scope of this paper. Our subject includes cases with primarily cosmetic, rather than functional, implications. Though correction may not be essential for reasons of health, surgery is justified when it is followed by satisfaction to all concerned.

Classification

There are three main types of chin deficiency:

1. Micrognathia is a hypoplastic retruded mandible accompanied by distocclusion. Its relief requires surgery with osteotomy usually accompanied by bone grafting for union, plus an onlay graft for contour. Some also require an inlay split skin graft to free the lip and cheeks and to create an adequate buccal sulcus.

2. Microgenia represents underdevelopment of the anterior (mental) part of the mandible. Malocclusion, if present, is not functionally significant.

3. Retrognathia is a condition where the mandible is essentially of normal size but retruded. Correction usually requires a sliding or step osteotomy with or without bone

grafting. Some workers have introduced a foreign body, as methyl methacrylate, into the temporomandibular joint capsules behind the condylar heads to hold them, and hence the mandible, forward.

Except for two cases of micrognathia in which there was insufficient bone to anchor bone grafts, the cases considered in this paper belong to the second group. Correction was accomplished with implants of autogenous living tissue, homologous preserved tissues, or alloplastic substances. Before the availability of well-tolerated alloplastic material, I was loyal to autogenous cancellous iliac bone, feeling that its many advantages justified its use even in minor deformities. However, it is technically laborious and accompanied by patient morbidity and temporary disability, greater no doubt than recognized during my earlier enthusiasm.** My revised opinion is that it is now justified only in conjunction with other reconstructive procedures where a living graft is required, or to provide both lateral body and mental symphysis augmentation.

Materials

1. Cartilage: Autogenous tissues are still worthy of primary consideration, for they are living grafts, not foreign bodies. Rib cartilage was a popular choice some years ago, but time has proved that it is gradually absorbed in the majority of instances. In fact, autogenous cartilage has not stood the test of time much better than homogenous human preserved cartilage. Therefore, it is the conclusion of most workers that it does not do anything that other substances cannot do better.

2. Bone: We now have had ample experience with autogenous bone from three sources—the tibia, split ribs, and the ilium. In most instances, a scaffold or cortical bone is not required. It is the cancellous bone which acquires adequate circulation early, from the recipient bed, for its vitality and survival. It has usually become fixed and firm within a few days in contact with freshened bone or periosteum; fixation with hardware in small to moderate defects is not required. Chips or "crumbs" of cancellous bone are readily contoured and supported by moderately firm dressings. It is my impression that a graft of all cancellous iliac bone "takes" by early ingrowth of capillaries comparable to that which occurs in free dermal skin grafts. When a living autogenous graft is desired in moderate to large quantity, it is the number one choice. Its size will gradually diminish if it is not performing the usual function of bone or when not firmly attached to living bone or periosteum. (Figs. 1 and 2)

3. The Pedicled Fat Graft: There is often an adjacent supply of fat in the submental region of individuals whose chins are small.

Fig. 1. Typical microgenia, under-development of mandible but with near normal occlusion. No functional problems. Corrected, in fact over-corrected, by an all cancellous iliac bone graft. Incidentally, a rhinoplasty enhanced the result.

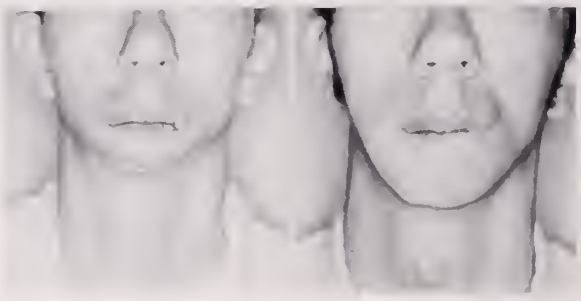

Fig. 2. Micrognathia with hypoplastic retruded mandible. It has three teeth, only one of which is of functional value. Preserved cartilage grafts were placed (note submental scar) at 5, 8, and 12 years of age before the advent of Silastic, to facilitate growth of the soft parts. At 15, remnants of cartilage were removed and a large horseshoe-shaped soft solid Silastic implant inserted. At 18, this was removed and replaced with the right iliac crest. Cortex was retained on only the outer side of the graft; it was cross-hatched to facilitate bending. The graft was then wired, cancellous side against the mandible, beneath periosteum. Many cancellous bone chips were packed about its ends and edges. The graft soon became firm and stabilized. A split skin buccal inlay graft to create a sulcus is now contemplated to facilitate construction and wearing of a denture.

**Reconstruction of Bony Defects of the Face, with special reference to cancellous iliac bone. S.G. & O., 1946, Vol. 83.

It may be pointed out by the patient himself, with more or less distress or feigned levity, as the "double chin". I have never seen a patient sentimentally attached to it—and he is pleased to know that it might be good for something. Through a submental transverse incision the fat may be freed as a double-pedicled visor, even with a strip of dermis or de-epithelialized skin along its lower edge. It will fit nicely into a pocket created for its reception between the periosteum and subcutaneous tissue. Three stitches through the skin just above the chin and tied over small bolsters of dental or ophthalmic rolls will hold it in its proper place without objectionable tension until dependably fixed.

This graft deserves consideration as a living autogenous graft where it is to the patient's advantage to "trade" two small chins for one of acceptable size. It may be used also in addition to alloplastic material, to be described below, when additional augmentation is desirable. It is not subject to the unpredictable absorption which characterizes the free fat graft. (Figs. 3 and 4)

4. The Derma-fat Free Graft: Free fat with overlying de-epithelialized skin has limited use where more than the chin needs augmentation. I have used it with satisfaction in facial hemiatrophy and in maldevelopment and atrophy incidental to scleroderma. Some of the fat will inevitably be absorbed but, if the defect is over-corrected by twenty to thirty per cent, gratifying improvement may be anticipated. (Fig. 5)

5. The Congenital Nasal Hump: Many individuals who have a congenital nasal hump also have a small chin. The chin may appear small merely by comparison with a large and overbearing nose. In actually small chins, however, when rhinoplasty is performed the hump can be salvaged, nasal mucosa trimmed or scraped from the two vaults of the nasal cavities on its deep side, and transplanted to the chin. It is inserted either through a short intra-oral mucosal incision above the depth of the buccal sulcus or through a submental incision, its deep side upon the periosteum.

This maneuver is so simple for the surgeon and satisfying to the patient that it has become a "fringe benefit" to the rhinoplasty in fifteen or more per cent of these cases. Dr. Gustav Aufricht* of New York City states that he corrects some fault of the chin in half to two-thirds of his rhinoplasties. (Fig. 6)

Fig. 3. An inadequate chin; in fact, two chins, the lower one doing nothing to improve its appearance.

Right, result of raising the submental fat as a bipedicled visor flap rotated into a pocket over the periosteum. It survived as a living graft, losing none by absorption which characterizes free fat grafts. She has "traded" two small chins for one of acceptable size.

Fig. 4. Pierre-Robin syndrome with micrognathia, unilateral cleft lip and double incomplete extremely wide cleft palate; also, Treacher-Collins syndrome with maldeveloped malar compounds and bilateral microtia. Cardinal physical characteristics of both syndromes are extremely rare in the same individual. Very small mandible was inadequate for osteotomy or bone graft. The few teeth of poor quality were in open-bite.

Right, great improvement following bipedicled fat graft from neck plus large soft solid horseshoe-shaped Silastic implant. Scar from incision in an infra-manibular fold is not objectionable.

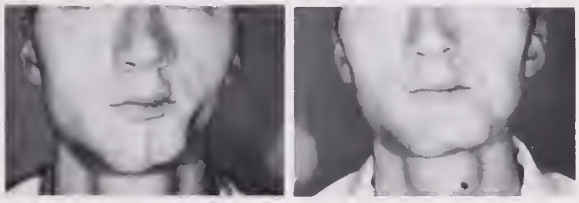

Fig. 5. Facial hemiatrophy from arrested scleroderma corrected by a large modified Y-shaped graft of decorticated dermis plus fat from thigh and buttock. It was over-corrected but lost not over 20 per cent by absorption. The end result is shown except for a small residual notch below left side of chin subsequently corrected by insertion of a small pyramid of Silastic.

*Plastic and Reconstructive Surgery, March, 1969.

6. Alloplastic Substances: The literature contains many descriptions of foreign materials conceived in optimism, introduced with haste or ill-guarded enthusiasm, and discarded with apology or silence. Among them are ivory, paraffin, metals, ox bone, polyurethane plastic (Ostamer), polyvinyl alcohol (Ivalon), acrilic, and more recently synthetic materials subsequently found to be less desirable than the silicone derivatives. All of them are described in the literature of the past two decades and no useful purpose would be served by reviewing them here.

The silicones have a dimethyl siloxane radical which may be polymerized, creating substances ranging from liquids to resins. They are inert, retained in body tissues with negligible reaction. No tumors have to my knowledge been reported. The most useful products are produced by Dow Corning in a medical grade so-called silicone rubber; it is made from dimethyl siloxane and is available as fine and coarse sponge; soft, medium and firm solids. Many clinical investigations and uses have been reported during the past twenty or more years. These include contour defects of every description involving the head. The curing of these materials has not apparently altered the basic advantages of the silicones but even the closed cell sponges have distinct disadvantages, apparently mechanical rather than chemical. Local tissues respond to their presence. Yellowish serosanguineous fluid surrounds the sponge and invasion by local tissues appears to be superficial. Detailed observations upon this process were reported by Brown, Fryer and Ohlwiler in 1960 and by Speirs and Blocksma in 1963.† The latter state that a silicone rubber membrane has a high diffusion rate for gas and water vapor but not serum and blood. Thus, the indications are that sponges which entrap tissue fluid finally become infiltrated by tissue. Entrapped fluid and the presence of foreign body, invaded or not by host tissue, are an invitation to infection and rejection. Soaking a sponge in antibiotic solution before introduction, plus antibiotic coverage during convalescence is no assurance against subsequent alteration in size or shape of the implant or against rejection at some remote date. Thus, the early and ultimate fate of these implants is less predictable than that of solid substances. If infection does occur, it is worse with a sponge and probability of rejection is greater. (Fig. 7)

†Plastic and Reconstructive Surgery, Sept. 1960 and February, 1963.

Fig. 6. Improvement of moderately flat chin by insertion of the congenital nasal hump salvaged from his rhinoplasty. Less nose plus more chin equals a better looking youth; the relatively simple chin augmentation compounded, in one operation, the benefit of either procedure alone.

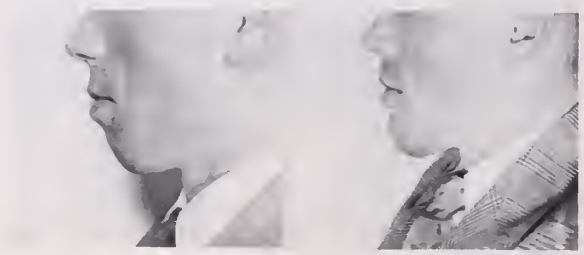

Fig. 7. Correction of inadequate chin with a large prefabricated Silastic implant inserted through short external incision well behind rim of mandible. Thus placed, the scar is acceptable and the added risk of an intra-oral incision avoided.

Technical Considerations

The chin implant may be inserted through an intra-oral incision on the back side of the lip about one-half to one cm. above the buccal sulcus, or externally through the skin in the submental region. In either case, the incision should be reasonably far from the location of the implant, and it should be closed in three staggered layers without drainage. A subperiosteal pocket looks reasonably acceptable idealized in diagrams but, in my opinion, it is usually not practical. The periosteum is easily wrecked in being elevated and, intact or not, there is not enough of it to cover an implant of worthwhile size. It is simpler and probably best to place it directly upon the periosteum except perhaps in a large bone graft as shown in Fig. 2. If so placed, mobility of the implant has not been a problem early or late. Therefore, mechanical fixation to the

bone at the time of surgery is superfluous in the smaller grafts, but an external pressure dressing for several days is wise.

The implants are available pre-formed, appropriate in size and shape for many patients. In others, a more appropriate implant may be fashioned at the operating table. Prolongation of the operation is not a problem with the patient under local anesthesia and adequate sedation. The soft solid Silastic cannot be filed or sanded; it must be carved with a sharp knife. Some surgeons have melded a thin layer of Dacron mesh or Teflon felt to the back side of the implant, using Dow Corning Silicone Type A adhesive. This is an unnecessary step, and it introduces additional foreign substance. Fixation is really not a problem when the recipient pocket is of proper size and closure of the wound is performed with staggered layers. If one feels more secure in providing some means of fixation, any number of holes may be punched through the implant, anticipating ingrowth of fibrous tissue.

The mental nerves should be avoided if possible. Occasionally, a patient will report dysthesia of the lower lip, but I have never known it to persist.

Discussion

Autogenous tissue is now, and probably will always be, the best material for implantation. However, there are many reasons for seeking and perfecting substitutes for use in those instances where appropriate autogenous tissue is not readily available or where its procurement is accompanied by laborious and time-consuming operations followed by more or less morbidity of the patient. As noted above, even autogenous tissue is not always ideal nor results predictable. Therefore, an allopathic substance as nearly ideal as are the silicone derivatives is most welcome for tissue replacement. They now rate foremost and far ahead of the long list of foreign materials previously found to be unacceptable. The properties of an ideal tissue substitute have been listed many times by previous authors—chemically inert, not modified in the environment of the recipient site, free from foreign body reaction, non-allergic, non-carcinogenic, resistant to stress or strain, capable of pre-fabrication, and capable of being sterilized without altering its atomic or gross structure. Silastic conforms, and it is standing the test of time.

The chin is more important as a significant part in facial form and contour than is commonly realized. Good looks in man or woman leaves much to be desired if the chin is not in harmony with the other features. When much too large or much too small, correction often indicates treatment of other abnormalities. For example, the entire mandible may require reconstruction, reduction, or augmentation. In such instances, more or less major dental cooperation is required and these cases are not within the scope of this paper. We have rather emphasized a common condition which may be of great importance to patients, particularly those who are sensitive, and certainly for many reasons, occupational or otherwise.

Far more patients have too little than too much chin; some think they have at least one too many.

We have called the small chin inadequate, for indeed it is when considered in relation to pleasing contour and harmony with the other features. The main types of chin deficiency have been defined. That which lends itself to relatively simple, but rewarding, augmentation without major dental or other requirements is termed microgenia—but let us keep our terminology, as well as technic, simple and call it "inadequate chin."

Summary

A long history of autogenous, homologous and allopathic implants for augmentation of the chin has been reviewed. Some have been abandoned, many are losing their favor, but the silicones are now accepted as safe, comparatively simple to manage, and reasonably predictable for lasting satisfaction. Autogenous bone, pedicled derma-fat grafts and occasionally free derma-fat grafts, and the congenital hump salvaged in approximately fifteen per cent of rhinoplasty cases represent the survival of time-tried autogenous tissues and they should be recommended wherever feasible. Among the allopathic substances, the survivor is Silastic. •

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Improving the prognosis for breast cancer patients*

Victor A. Gilbertsen, MD, Minneapolis, Minnesota

This study shows that regular annual medical examination, with self-examination in the interval, is a practical and effective method of detection of breast cancer prior to lymph node involvement—the key to five-year-survival.

CANCER IS ONE of the most important diseases that afflict mankind today, important because of the number of deaths it causes and significant because of disability and morbidity it produces. Cancer of the breast is one of the most frequently occurring fatal cancers —the most frequent cause of cancer death in women. Breast cancer is likely to be responsible for the deaths of four or five women of each hundred alive today.

For the past 20 years the Cancer Detection Center at the University of Minnesota has been engaged in studies related to the control of cancer, problems of its early diagnosis, and an evaluation of methods of survival improvement for patients with the disease.[1] Cancer of the breast and an appraisal of methods of its detection have been of special interest.

Studies have included efforts for evaluation of the potential for improvement in survival for patients with breast cancer when the disease is detected on routine examinations and prior to the time the patient is aware of a "suspicious" mass suggestive of its presence.[2,3] Several earlier reports from the Center have suggested substantial improvement in survival from that usually observed for women in the general population who develop breast cancer. I would like to report the current status of our continuing study, to present some of our recent follow-up data, and attempt to relate the results of our study to the overall problem of breast cancer.

The Cancer Detection Center study was begun in 1948 at the University of Minnesota Hospitals and Medical Center. The study includes a program of annual examinations of a group of essentially asymptomatic adults, analysis of the findings of the examinations, and careful follow-up of the participants in the program. Several aspects of the study are unique and worthy of emphasis. Patients upon entrance into the program are 45 years of age or older, indicate freedom from symptoms suggestive of cancer or other serious disease, and agree to return each year for examination as long as this is feasible. Last year, for example, about 90 per cent of patients examined were seen for their second or subsequent annual examinations. No treatment is given at the Center, and each patient agrees to visit his own physician following each annual examination for any therapy or further diagnostic measures which may be indicated.

Patients examined at the Cancer Detection Center during the 21 years of the study, March 1, 1948—February 28, 1969, have numbered 14,978 and 80,111 annual examinations have been performed. During the period for which a five-year follow-up could be done, from 1948 through February 1964, 41 breast

*The Annual Earl and Bessie Whedon Memorial presentation at the annual meeting of the Wyoming State Medical Society, August 27, 1969. The author is Director, Cancer Detection Center, University of Minnesota. This study was supported in part by the Fraternal Order of Eagles Cancer Research Fund.

cancers were detected at the Center, each subsequently confirmed by microscopic examination (Fig. 1). Of these 41 cancers, most (33, or 80 per cent) had no evidence of spread to lymph nodes upon examinations of the surgical specimens, and 32 of these 33 were five-year survivors. The other eight patients had tumors which had spread to lymph nodes or beyond; nonetheless, seven of these eight with lymph node involvement were also five-year survivors. The one patient who did not survive five years expired at another hospital a few weeks after her cancer was detected, and autopsy revealed widespread metastatic cancer. Thus, 39 of these 41 patients (or 95 per cent) were five-year survivors.

Cancer Detection Center

BREAST CANCERS

5 Year Survival

1948 – 1964

	Number	5 Year Survival	
		Number	*Absolute Rate*
NEGATIVE NODES	33	32	97.0%
POSITIVE NODES	8	7	87.5%
ALL	41	39	95.1%

Figure 1

With the passage of further time since the beginning of the Cancer Detection Center study, ten year follow-up data are becoming available for an increasingly large number of patients whose breast cancers were detected at the Center (Fig. 2). Twenty-eight of these patients whose breast cancers were found by annual examinations at the Center can now be followed for ten years or longer. Twenty-two of these 28 patients (78.6 per cent) were ten-year survivors.

When survival of the Cancer Detection Center breast cancer patients is compared with the observed or anticipated survival for women of the same ages in the general population without breast cancers utilizing the "relative" or actuarial method of Berkson and Cutler,[4,5] additional information of use

Cancer Detection Center

BREAST CANCERS

10 Year Survival

1948 – 1959

	Number	10 Year Survival	
		Number	*Percent*
NEGATIVE NODES	21	18	85.7%
POSITIVE NODES	7	4	57.1%
ALL	28	22	78.6%

Figure 2

in the evaluation of these results is available. While it is acknowledged that the women who have participated in the Cancer Detection Center program may not be identical in every respect to some women in the general population, our studies have shown that many basic similarities exist.[6] The desirability of age, sex, and race specific standards of anticipated general population mortality to permit some general comparisons has also been repeatedly demonstrated. Survival rates for the group of patients with breast cancers detected at the Center at five years appear to be virtually identical to those which have been observed for women in the general population, and at ten years, while not identical, were nearly as favorable (Fig. 3). For the

Cancer Detection Center

BREAST CANCERS

5 and 10 Year Survival

	Number	Survival		
		Number	*Absolute*	*Relative*
5 YEAR SURVIVAL	41	39	95.1%	100%
10 YEAR SURVIVAL	28	22	78.6%	96.8%

Figure 3

fortunate patients who had breast cancers found at the Center which had not spread to lymph nodes, survival at five and ten years was exceptionally good (Fig. 4).

Follow-up of the Cancer Detection Center patients showed that a number of additional breast cancers developed which were not detected on annual examinations at the Center,

Cancer Detection Center

BREAST CANCERS

5 and 10 Year Survival

(Negative Lymph Node Cases)

	Number	Survival		
		Number	*Absolute*	*Relative*
5 YEAR SURVIVAL	33	32	97.0%	100%
10 YEAR SURVIVAL	21	18	85.7%	100%

Figure 4

but rather were discovered during the between-examination intervals (or within 13 months of their last examination for those who dropped out of the study) (Fig. 5). During the 1948-1964 period, 25 active Cancer Detection Center patients developed breast cancers which were detected during the intervals between annual examinations. Each of these patients was operated upon elsewhere and the lesion excised. Sixty per cent had no evidence of lymph node spread, but ten of the 25 cancers (40 per cent) were found to have spread, already, to lymph nodes in spite of the circumstances that each patient had been examined at the Center during the year or so preceding detection of the tumor and no abnormality suggestive of cancer had been found. Only three of these ten patients with lymph node positive tumors lived longer than five years. Of the 15 patients with cancers without evidence of lymph node involvement, however, each was a five-year survivor. Thus, 18 of these 25 patients (or 72 per cent) were five-year survivors.

Cancer Detection Center

BREAST CANCERS

=Interval=

1948—1963

	Number	5 Year Survival	
		Number	*Absolute Rate*
NEGATIVE NODES	15	15	100%
POSITIVE NODES	10	3	30%
ALL	25	18	72%

Figure 5

Cancer Detection Center

BREAST CANCERS

= All Cases =

1948 – 1964

	Number	5 Year Survival		
		Number	*Absolute*	*Relative*
NEGATIVE NODES	48	47	97.9%	100%
POSITIVE NODES	18	10	55.6%	60.0%
ALL	66	57	86.4%	94.3%

Figure 6

Therefore, breast cancers discovered in Cancer Detection Center patients during the 1948-1964 period totalled 66, including the 41 cancers detected at the Center plus the 25 which were discovered elsewhere in the intervals between examinations (Fig. 6). The 41 which were found by annual examinations at the Center account for just under two-thirds of the total of 66 detected during this period. For those fortunate breast cancer patients without microscopic evidence of lymph node involvement, and this was nearly three-fourths of this group, survival at five years was not affected by their tumor. With cancers with lymph node or more extensive involvement, as noted, survival was not as favorable. The overall five-year survival rate for the 66 patients, however, was 86 per cent, and when age adjusted was 94 per cent.

As is well known, five- or ten-year survival for a breast cancer patient does not guarantee "cure" of the disease. Thus, it is not surprising that while the Cancer Detection Center experience has demonstrated a rather remarkable five-year survival rate, a few of the five-year survivors have later succumbed to their cancers. The number of such cases, however, has been small and not unanticipated.

Thus, the results of this study would appear to demonstrate that conventional methods of physical diagnosis, when utilized in a routine but systematic manner, permitted annual physician examinations to detect two of each three breast cancers which were found in the study participants. Follow-up of the group of patients with breast cancers which were detected at the Center showed that

their survival at both five and ten years was much improved from that usually reported for women with breast cancers and, in fact, compared quite favorably with survival of women of the same ages in the general population *without* breast cancer.

The addition of a program of self-examination permitted the recognition of most of the remaining one-third of breast cancers which were identified during the between-examination intervals. Here 15 of the 25 patients had cancers with no evidence of spread to lymph nodes, and all 15 of these patients were five-year survivors. Of the ten remaining patients, those with lymph node positive cancers which were detected between examinations, only three were five-year survivors, and of the seven who failed to survive five years, six are known to have died of cancer. It may be here, if anywhere, that a concept such as "biologic predeterminism" may be warranted, but it may be noted that these ten patients accounted for only a small minority of cases —about 15 per cent of the overall group of 66 patients.

Conclusion

From this study the following conclusions seem warranted.

(1) When cancers of the breast are detected by examination prior to the time of patient recognition of a "suspicious" abnormality, survival at both five and ten years can be substantially improved from that which is usually seen for women whose breast cancers are diagnosed only after an easily recognizable mass makes its presence obvious to the patient herself.

(2) Annual examinations by conventional methods of physical diagnosis appear adequate for the detection of most developing breast cancers prior to the occurrence of recognizable lymph node spread and while the overwhelming majority are treatable with conventional methods of surgical therapy.

(3) A detection program which includes once-a-year physician examinations supplemented with interval self-examinations should be anticipated to permit substantial survival improvement for breast cancer patients, the order of magnitude of which may compare quite favorably with the overall improvement which has occurred for cervical cancer patients following vigorous Papanicolaou smear promotion efforts of recent years. •

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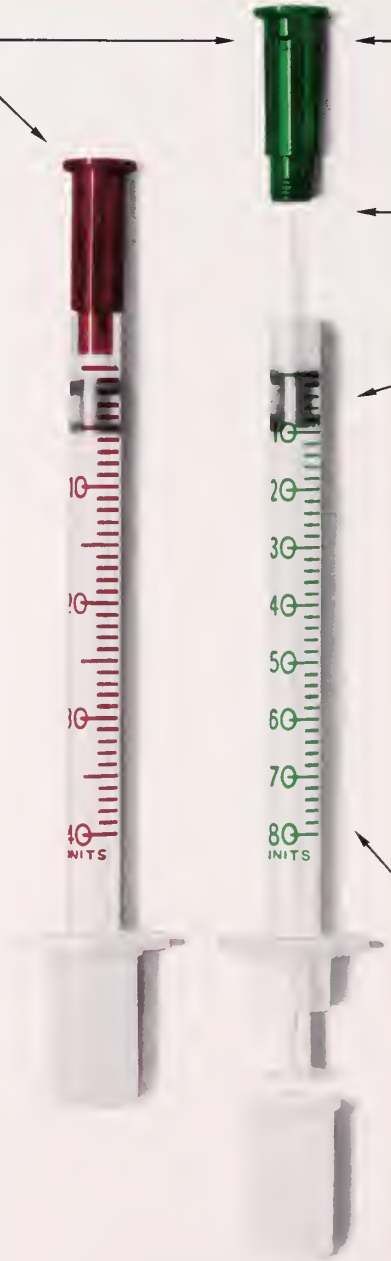

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Congenital factor XIII deficiency and increased fibrinolysis

A case report

Phongjan Hathirat, MD,
Bette A. Jamieson, MT
and Eugene C. Beatty, Jr., MD, Denver*

In 1948, Laki and Lorand[1] observed that fibrin made from purified fibrinogen by the action of purified thrombin dissolved readily in an equal volume of 60 per cent urea, whereas a clot formed from recalcified plasma by its own thrombin did not dissolve in urea. They concluded that calcium ions and a thermolabile serum component were involved in the urea-insoluble clot formation. In 1954, Loewy and Edsell[2] suggested that this newly recognized factor be called the Laki and Lorand factor. At the same time, the term fibrin stabilizing factor (FSF) was introduced by Lorand and his associates.[3-5] Fibrinase, the name given by Loewy, et al in 1961,[6,7] was officially recognized by the International Committee on Hemostasis and Thrombosis as blood clotting factor XIII, in 1963.[8]

*Phongjan Hathirat, MD, Fellow in Pediatric Hematology, Bette A. Jamieson, MT (A.S.C.P), Department of Hematology, and Eugene C. Beatty, Jr., MD, Pathologist and Director of Laboratories, Children's Hospital, Denver. (Dr. Beatty is now at Children's Mercy Hospital, Kansas City, Missouri.)

The characteristic feature of Factor XIII deficiency is hemorrhage, beginning often when the umbilical cord separates and subsequently occurring, as a rule from injury rather than spontaneously. The mode of inheritance is postulated to be autosomal recessive; Hampton et al in 1965 reported that the defect was transmitted through the x-chromosome instead of an autosomal gene. Transfusion of blood or plasma is therapeutically very effective. The half-life of Factor XIII is reported to be four to seven days in vivo. In patients, it has been noted that concentrations of less than 10 per cent and as low as 2 per cent of the normal levels of Factor XIII could effect normal hemostasis.[9,10,11,12]

CASE REPORT

A 5-year-old Spanish-American girl was admitted to Denver Children's Hospital in December 1967, for the investigation of a bleeding tendency prior to a tooth extraction. The parents were not consanguineous and there was no history of bleeding tendency on either side. The patient was a full term baby with an uncomplicated delivery, but there was a history of bleeding from the umbilicus after the cord had fallen off, during the second week of life. This lasted approximately two weeks, requiring cauterization and blood transfusion. The patient had a history of delayed wound healing, easy bruising from moderate trauma, and had a large organized hematoma on the arm following an intramuscular injection of typhoid vaccine. She also had hemarthrosis of the left ankle at three years of age. This was not known to be traumatic. She had been investigated twice previously for a clotting defect. The urea solubility test was performed during the third admission. The results of the coagulation studies are shown in Table 1.

Physical examination was unremarkable except for bruises and small organized hematomas on the arms and lower legs; no petechiae, lymphadenopathy or hepatosplenomegaly were noted. The patient received 5 c.c./kg of fresh plasma prior to tooth extraction without any excessive bleeding.

In May, 1968, she was admitted again in a semicomatose stage after three days history of increasing lethargy. Physical examination revealed left retinal hemorrhage and no venous pulsation in the right fundus. There were bruises over the lower extremities. She received two transfusions of fresh frozen plasma (instead of fresh plasma), however, her condition was not improved. She expired on the fifth day of hospitalization. Postmortem examination showed intraventricular hemorrhage.

TABLE 1

Tests and Methods	Patient	Normal Value (DCH)
1. CBC (routine)	Normal	
2. Platelet count	270,000/mm³	200,000-500,000/mm³
3. E.S.R.	3mm/hr.	
4. Ivy bleeding time	2 minutes	1-6 minutes
5. Lee-White clotting time	5 minutes	5-12 minutes
6. Rumple-Leede test	3 petechiae	5 petechiae
7. Clot retraction	Beginning at 35--min., complete by 4 hrs.	
8. Clot Lysis	Completely lysed in 18 hrs. Patient's plasma + normal clot = almost completely lysed in less than 12 hrs.	No lysis before 24 hrs.
9. Quantitative lysis	Patient's plasma and thrombin lysed in 16 hrs. ½ patient's + ½ control plasma + thrombin = softening of clot	Control plasma thrombin no lysis before 24 hrs.
10. Euglobin lysis	Completely lysed in 45 minutes	> 2 hours
11. Prothrombin time	13 seconds	12 seconds
12. Partial thrombopl. time	35 seconds	< 45 seconds
13. Thrombopl. generation test	Normal	
14. Recalcification time	8 min. 30 seconds	
15. Fibrinogen	370 mgm %	200-400 mgm%
16. Coagulogram (Dr. von Kaulla's lab in Aug. 1964)	Normal onset of fibrin formation, but the coagulogram does not attain a normal width	
17. Urea solubility test	Lysis within 1 hrs.	> 24 hrs.

Methods

1. FACTOR XIII ASSAY. Modified from J. W. Hampton, et al,[13] 9 c.c. of venous blood was anticoagulated with 1 c.c. of 2.94 per cent sodium citrate and centrifuged in the refrigerated centrifuge at 3,500 rpm for 15 minutes to obtain platelet-poor plasma. Each plasma sample was tested undiluted 1:1, 1:60, 1:80, 1:100, 1:240 and 1:1000 with tris-buffered saline, adjusted to pH 7.2, 0.04 c.c. of epsilon aminocaproic acid (12.5 gm % dilution) was added to the diluted plasma to eliminate interference by fibrinolysins.[14] A 0.2 ml aliquot of a solution of lyophilized bovine fibrinogen (Warner-Chilcott, 3mgm/mm) was added to a 0.2 ml aliquot of each diluted plasma. Each lot of bovine fibrinogen used was tested for fibrin stabilizing factor activity and was found to have negligible amounts since clots made from this fibrinogen solution dissolved in 5 molar urea in less than 40 minutes. The mixtures of diluted plasma and lyophilized fibrinogen were clotted by adding to each sample 0.2 ml 1/40 M $CaCl_2$ and 0.2 ml of thrombin solution (Parke-Davis, 10 u/ml). Three milliliters of 5 M urea were immediately added to each tube and observed for complete lysis at 25°C.

The average level of Factor XIII at Children's Hospital ranged from 90-140 per cent (data collected from five adult blood donors at the Hospital and fourteen patients in the 5-10 year age range, one of the patients was on heparin therapy).

2. FIBRINOLYSIS.

(a) Euglobulin clot lysis.[15,16]

(b) Observation of clot for lysis, using normal clot with patient's plasma and incubating at 37°C.

Results

This patient had Factor XIII levels of less than 1 per cent and also short euglobulin lysis time (on two occasions, seven weeks apart). Since we were aware that the patient had increased fibrinolytic activity, we used two methods for the performance of the Factor XIII assay:

(1) Without adding epsilon aminocaproic acid to the plasma.

(2) With epsilon aminocaproic acid added.

No difference in the level of Factor XIII was found using the two methods.

No clot lysis was observed on the second and third days after fresh plasma transfusion. The level of Factor XIII at that time was 12 per cent with and without the addition of epsilon aminocaproic acid.

The sixth day after plasma transfusion, the level of Factor XIII was 11 per cent. Unfortunately, we were not able to follow the level of the Factor XIII after the sixth day post transfusion.

Her excessive fibrinolysis was corrected with epsilon aminocaproic acid in vitro, but was not used on the patient. The average levels of Factor XIII in the family were: 85 per cent in the parents and 75 per cent in the two siblings. Deficiency of fibrin stabilizing factor (FSF) in this patient appears to be congenital because of the umbilical bleeding, and because she has had no illness known to produce an acquired Factor XIII deficiency.

Discussion

In 1960, Duckert and his associates[9] described a familial bleeding disorder caused by a deficiency of Factor XIII. At the present time, at least 32 cases of congenital Factor XIII deficiency have been described in the literature: however, none of these cases demonstrated fibrinolysis. There is also a report of an acquired inhibitor of Factor XIII.[18]

Acquired deficiency of Factor XIII has been observed in patients with acute myleblastic anemia, hepatic disease, obstetrical patients with hypofibrinogenemia, and in a patient with mercury intoxication.[19] Reduction in Factor XIII activity has been described in association with multiple myeloma,

lead poisoning, pernicious anemia and agammaglobulinemia.[4,5,20] Weiner and Farahangi[21] found low Factor XIII activity in a patient with a plasma fibrinogen level of 1.2-2 gm per cent. Recently, Baggett, et al[22] reported excessive bleeding in two patients with an acquired coagulation disorder who also had abnormal liver function. They demonstrated circulating fibrinolysins and reduced Factor XIII activity. The latter remained unchanged in one patient when the fibrinolysin was inhibited by epsilon aminocaproic acid therapy.

How can FSF deficiency and fibrinolysis be correlated in this patient? There are two types of fibrin.[23,24] One is soluble in 5M urea and is formed when fibrinogen is converted to fibrin by thrombin in the absence of either the FSF or calcium ion. This type is known to be hydrogen bonded. The second is insoluble in urea and is formed when the conversion takes place in the presence of FSF and calcium ion. This type is sulfhydryl bonded. In 1961, Bickford and Sokolow[25] suggested that the urea-insoluble fibrin (fibrin-i) formed in the presence of FSF and calcium is less susceptible to fibrinolysis than the urea-soluble form (fibrin-s) though several workers had observed an inhibitory effect of calcium on plasma lysis.[26,27,28,29] In 1964, Tyler and Lack[30] reported some studies on the relationship between FSF, calcium and inhibition of fibrinolysis, and the results indicate that calcium activates FSF which in turn leads to retardation of activation of plasminogen within the clot, and the FSF istelf may be acting as an antiactivator.

This patient has FSF deficient plasma and when coagulation occurs, she either lacks the anti-activator of plasminogen or has a relatively elevated plasminogen activator. With the low FSF level, the fibrin formed should most likely be fibrin-s type which is susceptible to fibrinolysis. Two days after fresh plasma, no clot lysis was observed at 24 hours. Although one might assume that fibrinolysis in this case is secondary only to the weak clot due to severe deficiency of FSF, the fact that she has a fibrinolysin present in her plasma that lyses a normal clot within 12 hours suggests the presence of elevated plasminogen or its activator.

—The lowest priced tetracycline—nystatin combination available—

Summary

A case of congenital FSF deficiency with a fibrinolysin has been described. The two associated anomalies do not appear to be related although definitive proof of this is lacking. Epsilon aminocaproic acid is effective against fibrinolysis in this case (in vitro), but does not affect the level of FSF (in vitro). Fresh plasma corrects both the FSF deficiency and the increased fibrinolysis. Unfortunately the patient died of spontaneous intraventricular hemorrhage precluding further study to elucidate the association of these two coagulation abnormalities. •

We wish to thank Dr. Raymond J. Rademacher for his cooperation in making the studies on his patient possible.

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The epileptic in Montana*

Survey of Existing Services and Facilities

James J. Cereghino. MD, Arlington, Virginia

The United States Public Health Service Advisory Committee on the Epilepsies is documenting services and facilities available to the epileptic in selected areas of the United States.[1,2,3,4] The material presented on Montana in this summary article is further documented in a monograph available on request.[5]

Dimensions of the Problem

A registry of epileptics is not maintained in Montana. Various estimates of the prevalence of convulsive disorders in Montana may be made. The Epilepsy Foundation of America has estimated that as high as 2 to 3 per cent of the population of the United States has some form of epilepsy.[6] On this basis in Montana, with a 1967 population estimate of 699,000,[7] there would be a minimum of 14,000 people with some form of epilepsy. The Kurland survey of Rochester, Minnesota, may be used to make another minimal estimate of the prevalence of convulsive disorders.[8] Although the application of the Kurland figures to Montana is subject to statistical limitations, they will be used since more accurate data on prevalence do not exist. With this method there are approximately 4,000 individuals with a convulsive disorder in Montana.

The Montana Statewide Planning Project for Vocational Rehabilitation Services and the Sociology Department at Montana State University surveyed major agencies to identify the number of individuals with disabilities serious enough to seek aid. 10,555 individuals were identified in Montana with substantial disabilities which impose limitations. 382 epileptics were identifed representing 3.61 per cent of the total identified handicap. These figures are extremely conservative since they omit the individual without obvious deformity whose seizures are under good medical control and they omit the severely disabled receiving home care.[9]

Additional sources of prevalence statistics come from the Montana State Hospitals. At the Boulder River School, approximately 24 per cent of the state's in-residence mental retardate population of approximately 1,000 on July 31, 1969, had an associated seizure disorder.[10] At the Warm Springs State Hospital the number of individuals institutionalized with a diagnosis of convulsive disorders was 62 (5 per cent) of the approximately 1,200 in-resident population on August 12, 1969.[11]

*From the Neurological and Sensory Disease Control Program, Division of Chronic Disease Programs, Regional Medical Programs Service, Health Services and Mental Health Administration, Department of Health, Education, and Welfare.

Reprint Requests: Room 5-D-18, Bldg. 36, National Institutes of Health, National Institute of Neurological Diseases and Stroke, 9000 Rockville Pike, Bethesda, Maryland 20014. (Dr. Cereghino)

Figure 1

Estimated Prevalence of Persons with Convulsive Disorders in Montana

Source	*Estimated Prevalence*	*Estimated Prevalence in Montana* (subj. to statistical limitations)*
Epilepsy Foundation of America[6]	2500/100,000	17,500
Kurland Survey of Rochester, Minnesota[8]	376/100,000	4,000†
Montana agency survey of chronic disability and activity limitations[9]	54/100,000	380‡

*Based on 1967 population estimate of 699,000[7]
†Considered minimal because cases not coming to medical attention were omitted.
‡Extremely conservative estimate because epileptics whose seizures are under good medical control and those severely handicapped were omitted.

Physician Availability

There is no medical school in Montana. Postgraduate education on the convulsive disorders has been through sessions at the Montana Medical Association's Annual meeting[12] and through articles appearing in the *Rocky Mountain Medical Journal*. The Mountain States Regional Medical Program has identified continuing postgraduate education as a major need of the region and a circuit course on convulsive disorders was held in Great Falls, Billings, and Missoula for physicians and allied health personnel in November of 1969.[13]

Figure 2 shows the distribution of physicians with a specialty interest in the neurological sciences in Montana. Figure 3 characterizes these individuals. The majority of these physicians are located in Billings, Great Falls, and Missoula, the areas of largest population. Since there are 13 physicians with a specialty interest in the neurological sciences throughout the state, the neurological physician-population ratio is approximately 1:54,000.

Diagnostic Services

There are no specific clinics for diagnosis and treatment of epileptics in Montana. Three diagnostic services are available to, but not primarily for, epileptics in Montana: Children and Youth Project, Lewis and Clark County Health Department, Helena, Montana; Montana Children's Home and Hospital, Shodair Crippled Children's Hospital, Helena, Montana; and Missoula City-County Health Department, Diagnosis and Evaluation Clinic, Missoula, Montana.

It is thought the majority of seizure patients are treated by general practitioners or pediatricians. Patients these physicians find difficult or impossible to handle because of lack of local facilities or training or experience are referred to neurologically trained physicians for diagnosis and treatment. In some cases patients are referred to more specialized regional centers in Washington or Minnesota

The neurological facilities that are present are considered adequate. A need exists for training of allied medical personnel. At the present time, electroencephalographic technologists, neurological or neurosurgical nurses, etc. must either go out of state for training or learn informally from local individuals working in the specialty.

Epilepsy is *not* a disorder cared for under the Montana Crippled Children's Program. Lack of medical and allied personnel to staff a seizure clinic is the major obstacle to inclusion of epilepsy in the Program at the current time. The Montana Department of Public Welfare will pay for physicians' services, (in or out patient) and travel to such services for those eligible for the welfare program.

Electroencephalograms may be obtained from private facilities and from seven hospitals throughout the state (Figure 2). Approximately 2,000 electroencephalograms are performed yearly at these hospitals.[5] The number of electroencephalograms performed by private physicians in their offices was not estimated. Facilities for arteriography are available at 18 Montana hospitals.[5] Facilities for temporal lobectomy and implanted electrode studies are not available in Montana.

According to the registries of the Indian Health Service facilities, 67 cases of convulsive disorder are receiving care. This does not include all Indians in Montana since some receive medical services from other sources. The 1960 Indian population of Montana was 21,181.

Special Problems of a Sparsely Populated Area

The provision of medical services in sparsely populated areas offers a tremendous challenge. It has been demonstrated that among mental patients in Montana, long distance from treatment facilities apparently operates against use of facilities.[14] A comparable situation would be assumed to exist for seizure patients in need of long-term care.

Transportation to distant facilities is a particular difficulty for the epileptic patient. An adult patient often encounters difficulty obtaining a license to drive and becomes dependent on family and friends for transportation. Public transportation in Montana is limited. Inter-city busses are a main source of public transportation and severe winters make traveling by this means somewhat of a problem. With the severe winters and sparse population the determined people of Montana have made frequent use of the "caretaker system" where neighbors become dependent upon one another for survival. It is not infrequent for neighbors to bring epileptics to their medical appointments.

The attraction of medical personnel, particularly specialists, to sparsely populated areas is a constant problem. Model Cities Programs in Helena and Butte rate this high on their list of actions. There is also a continuing need for training and recruitment of allied medical personnel to support the physicians

Figure 2

DISTRIBUTION OF NEUROLOGICAL SERVICES

STATE OF MONTANA

AUGUST 1969

Figure 3

Characteristics of Physician With Special Interest In the Neurological Sciences[28,29]

Neurologists		*Neurosurgeons*	*Neurologist-Psychiatrist*	*General Practitioner*	*Total*
Total	3	6	3	1	13
Board Certified	0	3	3	0	6
Private Practice	3	6	3	1	13
Primarily Institutional	0	0	0	0	0

in the area. The Western Interstate Commission for Higher Education has provided some help in training physicians who return to their community but more help is needed.

A unique electronic way of overcoming the problem of providing medical service to sparsely populated areas is being demonstrated by the Intermountain Regional Medical Program and the University of Utah.[15,16] Electroencephalograms require trained personnel to perform and interpret. Electroencephalographic laboratories exist only in larger communities and the problem of distance, the expense of travel and the delay in obtaining reports may influence physicians not to obtain electroencephalograms in patients where they may be indicated. The University of Utah has been evaluating the technical and financial feasibility of routine transmission of electroencephalograms from Twin Falls, Idaho to Salt Lake City, Utah. Six channel electroencephalograms have been successfully transmitted with no interruption or termination from data set malfunction or interference in line transmission. An average time of 35 minutes was necessary for transmission of each record and final report. Changes in calibration are correctable with a potentiometer. Extraneous artifacts have been minimal and easily identifiable. Telephone communication between the technicians can settle questions of abnormality versus artifact. At the present time one telephone line can transmit only three channels of physiological data. Bell System's Laboratories are currently experimenting to extend the capabilities of one telephone line to six channels. Special rates for this type of transmission have not been established.[15,16]

This project has successfully demonstrated the technical feasibility of transmission of electroencephalograms via telephone from a distant community. Financial feasibility is dependent on the number of channels transmitted, the number of records obtained and the distance between the two laboratories. In the Idaho-Utah demonstration, the cost of an electroencephalogram was about $20.00 higher than the usual charge in that area which was not thought excessive when considering the alternative of time and expense of travel to an EEG center.[15,16]

Governmental Programs

Model Cities Programs have been designated in Helena and Butte. Both of these programs will be focusing their attention on the health problems of their areas. While there are no specific plans just for epileptics in the health aspect of the programs, the care of the epileptic will be aided by the proposals to improve the overall quality of medical care.[17,18]

In October of 1965, Public Law 89-239 establishing Regional Medical Programs for Heart Disease, Cancer, Stroke and Related Diseases was enacted. The Mountain States Regional Medical Program, involving Montana, Idaho, Nevada and Wyoming, became active in November of 1966.[19] The needs identified which the Program will concern itself with include continuing education for all health personnel, cooperative hospital planning and increased medical manpower. A major survey of facilities and resources in Montana has been compiled.[20]

There are two full-time health departments in Montana with a health officer. In other areas of the state, full-time or part-time public health nursing services are available. During calendar year 1968, 2.8 per cent of all nursing contracts were for neurological diseases.[5]

An ample supply of literature on epilepsy for patients and professionals is available

from the Health Education Unit. A film, suitable for all audiences, is available without charge. "Guide for the Montana School Health Program[21] is published as a reference book for health instruction in Montana schools and includes a section on epilepsy.

Problems in Total Management of the Epileptic

Treatment of the epileptic patient involves evaluation of the type of seizure, correlation of the seizure pattern with the area of origin in the brain, selection of therapy based on the type of attack, and consideration of possible surgical therapy. But treatment of the epileptic does not end there. Part of the physician's art is to understand and assist the patient with particular problems of a socio-economic nature that result from the occurrence of his seizures. Emotional disturbances may precipitate some epileptic seizures. Thus, the physician must recognize this aspect of seizures and learn ways in which he can help the patient deal effectively with emotional problems. When he neglects this, he neglects a valuable part of the treatment of the epileptic.

The physician should be aware of the judicial aspects of epilepsy. There is no statute preventing the marriage of epileptics in Montana. Epilepsy alone is not sufficient cause for sterilization. The Montana Highway Patrol has responsibility for issuance of drivers' licenses. The statutory provision for licensing of epileptics provides that they will be seizure free for a period of two years before licensing. The patient's private physician is consulted and each case is reviewed by the State Health Officer.[22] A record of the number of individuals with convulsive disorders requesting and/or receiving licenses has not been maintained.

A statute requiring the reporting by the physician or other practitioner of persons with seizures or lapses of consciousness or control was enacted in 1955 and rescinded in 1967.[23] The law was considered ineffective since few such patients were reported. Questions were also raised as to violation of the patient-physician relationship by the statute.

Obtaining all forms of insurance is a problem for the epileptic in Montana. Minimum liability coverage is required of all drivers. The Montana Automobile Assigned Risk Plan provides that a company is not required to write coverage if the driver is subject to seizures. Although not well documented, there appears to be little probability that an epileptic could obtain automobile insurance in Montana even at increased rates. There are no publicized rates for life, health or accident insurance in the state but it is thought these would be at a higher rate if available.

The majority of children with epilepsy in Montana receive normal educations in standard classrooms. Teachers and school administrators appear to have a good knowledge of epilepsy and its implications in school adjustment. An occasional problem is still encountered in the form of prejudices from parents of other children.

While mental retardation and seizures are not of necessity related, it is known that in some children both seizures and mental retardation are produced as the result of an underlying brain disorder (i.e., trauma, infection, toxic factors, metabolic factors, etc.). Thus there is a need for facilities available to the mentally retarded with seizures. Since July of 1964, Montana has been involved in an overall plan to combat mental retardation. The Montana Mental Retardation Planning Committee, composed of over 50 representatives, functioned as a steering committee for the development of the plan. In December of 1965, a series of recommendations were made[24] which are continuing to be implemented.[25] As a direct result of the project, Mental Retardation Information Centers have been established in each county for the purpose of answering questions of parents of the retarded or the retarded themselves and making referrals to proper sources. A list of these locations is available from:

Mrs. Maxine Homer, M.S.P.H.
Coordinator, Montana Mental Retardation Planning Committee
State Board of Health
Helena, Montana 59601

or in reference 5. A listing of recreation, physical education and social activities for the mentally retarded in Montana is also available.[26]

Employment and Rehabilitation

Employment is a major problem for the epileptic in Montana. Public rejection of the epileptic remains. Even the epileptic whose disease is well controlled and who is otherwise capable and qualified to hold a job suffers from the stigma of his disease. Potential employers are reluctant to hire epileptics. Employers are concerned about the epileptic's need for supervision, possible absentee rate and ability to produce sustained good work. Individuals dealing with employers have been only partially successful in allaying such fears. It appears that the employer in Montana needs direct local experience with the epileptic or with another employer who has had experience with the epileptic before he will consider hiring an epileptic.

The Montana State Employment Commission operates 24 offices throughout the state. There is no specific program for epileptics. During the first eight months of 1969, six of 166 clients had a seizure disorder. In one of these cases, the seizures were associated with alcoholism. Representatives of the State Employment Commission outlined the following problems encountered in dealing with the epileptic:

1. The main problem faced by the epileptic is whether to inform a prospective employer of his disability.

2. Employers considering hiring of an epileptic prefer to talk to another local employer who has had experience with epileptic employees before hiring an epileptic. Information provided on a national basis does not seem as effective.

3. The questions most frequently asked by employers about epileptics relate to retention, the need for supervision and the absentee rate.

Ten Division of Vocational Rehabilitation offices in Montana provide services to persons having disabilities, including epilepsy, which prevent them from obtaining and continuing suitable employment. In order to receive services, the individual must have a feasible chance of becoming employable after receiving rehabilitation services. During fiscal year 1968, of 659 cases classed as rehabilitated, 17 (2.57 per cent) had epilepsy as their major disabling condition, representing 1.66 per cent of the total cost of cases. During fiscal year 1967, of 616 cases closed as rehabilitated, 16 (2.59 per cent) had epilepsy as their major disabling condition, representing 2.19 per cent of the total cost of cases.

Counselors dealing with epileptics encountered the following special problems:

1. Placement is the biggest problem with the epileptic client.

2. Epilepsy is still a vocational handicap in Montana from the stigma alone, even if the disease is well controlled. Public rejection of the epileptic still exists.

3. A formal attempt is not made to help the handicapped while they are still in high school. Counselors try to get involved with this age group but try not to finance the individual while still in school.

4. There are a few workshops in Montana.

The Second Injury Fund in Montana is available only to persons who have previously lost or lost the use of a member or eye and are totally and permanently disabled by the loss or loss of use of another member or eye.[27] The lack of inclusion of provision for the epileptic in the Second Injury Fund is seen as a further deterrent in obtaining employment.

There are no specific workshops for epileptics in Montana. There are two workshops —the Butte Sheltered Workshop in Butte, which served five epileptics among 35 clients in 1968 and Handicapped Inc., Billings, which served two clients, both epileptics in 1968. While both workshops provide the best service possible with current limitations, it is thought that neither offers the range of services required to adequately meet the needs of the disabled. The Comprehensive Statewide Planning Project for Vocational Rehabilitation Services has recommended establishment of at least one workshop offering complete vocational rehabilitation services.[9]

Four existing facilities are classified as treatment or rehabilitation centers in Montana: Montana Center for Handicapped Children, Billings; Shodair Crippled Children's

Hospital, Helena; Montana Easter Seal Rehabilitation Center, Great Falls; and Missoula Crippled Children and Adult Rehabilitation Center, Missoula. Out of state rehabilitation centers and workships are utilized when feasible.

The Montana Statewide Planning Project for Vocational Rehabilitation is one of fifty statewide planning programs to assess vocational rehabilitation needs and resources as provided by the 1965 Amendments to the Vocational Rehabilitation Act (PL 89-333). A policy board was appointed in Montana in December 1966 and a final report prepared in November 1968.[9] A lengthy list of recommendations has been formulated, designed to provide an orderly unduplicated statewide plan by which all disabled persons needing rehabilitation services will have access to them by 1975.[9]

Lay Organizations

A specific lay organization for epileptics with association with the National Epilepsy Foundation of America does not exist in Montana. There are two lay organizations which provide services to the epileptic in Montana.

The Coordinating Committee on the Handicapped of Missoula adopted a constitution on May 14, 1969. The Committee represents an effort to coordinate the existing organizations for the handicapped in Montana by avoidance of duplication in services and by increased numbers to act as a community focus. Information on membership can be obtained from:

Mrs. Ruth Parnell
Coordinator, Community Action Center
508 Toole
Missoula, Montana 59801

The North Central Montana Information and Referral Service provides information on community resources for a sixteen-county area of North Central Montana. Both children and adults are served. Information may be obtained by writing to 1812 Tenth Avenue South, Great Falls, Montana 59401.

Summary

The problems disclosed in Montana by the survey of existing services and interviews of people interested in epilepsy indicate that the epileptic needs assistance in the following areas:

1. Diagnostic Facilities. There is a need for additional diagnostic facilities and for the professional and allied health personnel to staff these clinics. Sparsely populated areas offer a tremendous challenge to the provision of medical services. Model Cities Programs in Butte and Helena and the Mountain States Regional Medical Program are attempting to correct this situation. There is a need to train and/or recruit allied health personnel for neurological facilities. When the neurologically trained physician is unable to completely evaluate a patient because of lack of local facilities, referral to an out-of-state facility, with the inconvenience of travel and time factors, is necessary. The absence of a medical school within the state contributes to both of these problems.

2. Public Acceptance of Seizures. There is an urgent need in Montana to remove fears and suspicions relating to seizures both by people providing services to the epileptic and by communities as a whole.

3. Employment. This is a problem for the adult epileptic in Montana which will need to be attacked from several areas.

A. Establishment of more workshops or training centers where epileptics can be eligible for service.

B. Education of employers aimed at 1. Hiring of epileptics. 2. Achievement of full job potential for employed epileptics.

C. The extension of the Second Injury Fund to include epileptics.

The Statewide Planning Project for Vocational Rehabilitation has made numerous recommendations to improve employment conditions for the handicapped in Montana.

4. Crippled Children's Program. Extension of Crippled Children's Services to children with seizures would seem desirable but is dependent on the recruitment of additional medical personnel to staff such an extension.

5. Education. Most epileptics appear to be receiving public education in Montana. There is still some fear on the part of teachers in dealing with seizures. Further efforts appear indicated in helping the adolescent epileptic achieve job potential.

6. Psycho-social Problems. There is a need for increased social and recreational activities for the epileptic. There is also a need for opportunities for the adult epileptic who has grown up in social deprivation to improve his social awareness.

7. Insurance. Further improvement of available life, health, accident and automobile insurance is needed based on a realistic appraisal of health factors.

8. Lay Organizations. A community focus is necessary to organize people who have an interest in the problem of epilepsy so they can effectively work together. In this way each individual or group can contribute maximally to an integrated team effort. •

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The physician and tumor registries

Charles R. Smart, MD,* Salt Lake City

IDEALLY MOST PHYSICIANS should ask cancer patients to return at specific intervals for follow-up examination; however, few physicians have a check-up system to assure themselves that patients do indeed return. As a consequence, cancer patients in many doctors' practices are not re-examined regularly enough to detect second primaries or recurrent disease at a time when it is still curable. The physician feels that each patient has freedom of choice, and if they choose not to return or choose to see another doctor that is their right. Doctors are at times fearful that too vigorous pursuit of the patient may be interpreted on the part of the patient as seeking business or a fee. A proper functioning hospital cancer registry should provide the assurance that regular follow-up is maintained and encourage physicians to call their patients in if they fail to keep their appointments and thus save many lives. Too often in the past, follow-up letters which should stimulate patient re-evaluation have not been sent or have arrived after the patient was terminal or had died.

Physicians in practice have been unable to evaluate fully their own experience without a prohibitive time-consuming review of their records. Therefore, a physician's choice of cancer therapy has often been based on medical school teaching and his knowledge of the medical literature, colored by isolated past experiences which stood out in his memory rather than on an unbiased evaluation of his total experience. Despite his interest in an analysis of his patients, tumor registries in the past have been unable or unwilling to assist him. Traditional tumor registries and their personnel are not equipped to solve the massive statistical and communicative problems involved in appropriate analysis of the data and returning it to the individual physician in usable form. Reports have of necessity been of the inventory "head count" type dealing with frequency rather than the effect of diagnosis and treatment on SURVIVAL. To implement the latter, reliable data is necessary. This requires careful, current abstracting of hospital records by well-trained personnel who must have a good knowledge of medical terminology and of cancer as well as at least 90 per cent current follow-up on all patients in the registry.

One of the major problems of the past has been that tumor registry secretaries have been untrained and poorly paid, resulting in rapid turnover. In addition to being poorly directed and motivated, they have been overwhelmed with the massive number of cases to be abstracted and with the large number of letters to be written and addressed by hand. Supervision and quality controls which are essential to the gathering of reliable data

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**A computerized registry system, a confederacy of Colorado, Idaho, Montana, Wyoming and Utah state tumor registries.

have been lacking. The potential of the hospital tumor registry in cancer control is excellent; however, it too frequently falls short of its goal for although the data are ideally suited to the mathematical manipulations of the computer with its ability to store and mass-produce various types of reports and letters, most individual hospital tumor registries have neither the volume of reliable data, the interested talent, nor the money to justify this approach.

At present, a new type of registry, a CENTRAL CANCER CONTROL REGISTRY, is currently being evaluated in the Rocky Mountain State Cooperative Tumor Registry. This Cooperative Registry is attempting to provide the practicing physician with a rational approach to *cancer control within his own office*. This central registry is a confederacy of individual state registries in Colorado, Idaho, Montana, Nevada, Utah and Wyoming, each being entirely independent in their organization and operation except all utilize a common nucleus of basic information and central computer service. This new type of registry has the specific role of assisting hospital registries accomplish their purposes by providing coordination, assistance, training, motivation, supervision, quality control and computer technology. The by-product of this assistance to these individual hospital registries will possibly be its most important function—the ability to split off individual physician splinters from the parent bush and return to each individual physician his own contribution to the whole. Without additional effort on the part of either the physician or his secretarial or nursing staff, the computer can generate from the central data bank for each individual physician his own office cancer registry.[1] Only individual physicians care for cancer patients, make diagnoses, prescribe or carry out treatment, re-examine and follow the patients' course. It is not enough to serve an international, a national, a state or a hospital group. If a registry is to exert an influence in cancer control, if it is to affect patient care and survival, it must recognize the role of the individual physician.

There is also the ABILITY TO MERGE THE DATA FROM MANY HOSPITAL REGISTRIES in a region and make the resultant analysis more meaningful because of the larger number of cases. The more general geographic coverage allows regional evaluation, cancer planning, and greater utilization of the data by medical societies, the cancer society, health department, etc.; as well as allowing automatic updating of individual hospital and physician registries from death certificates, re-admissions to any hospital, or the follow-up report from any physician.

Operation

The philosophy of operation was first to enhance the capabilities of the existing community hospital tumor registries without changing their abstracting or pattern of operation and then to serve the medical profession. Initial information on all patients is gathered by the tumor registry secretary or a trained field worker reviewing the patient's hospital chart and recording selected data on an abstract form. Continuing workshops are given to train personnel. A copy of each abstract is sent to the Central Office to be checked for completeness, accuracy, and against previous registrations. It is then coded and keypunched and added to the master file after a computer edit for consistency and accuracy. Follow-up letters are generated regularly by the computer on all patients who have not been reported as having been seen within the year. Upon the return of these pre-coded letters, the data file on each patient is immediately updated, and the letters are then sent to the individual hospital tumor registries for filing. Should the physician report the patient lost and give his consent to locate the patient, the hospital tumor registry secretary will first try to find the patient through a "tracer letter." If this is not successful, in Utah, a public health nurse is utilized to find and return the patient to medical care. The Division of Vital Statistics of the State Division of Health forwards information from death certificates to the Central Office where it is checked against the master index and information submitted to the computer to update the data bank. Notification is then forwarded to any hospital in which the patient was registered.

Output from the computer is outlined in Fig. 1 showing the various types of reports

which are generated for physicians, hospitals, states, regions and special groups of physicians. These reports are generated every six months or upon request. The confidential PHYSICIAN OFFICE REGISTRIES list not only all of a doctor's cancer patients by name, site, etc., irrespective of hospital, but also give a bibliography of selected current medical references[2] chosen by the local cancer committees[3] followed by state and national five year survival figures for that state.[4] Similar reports are produced for the larger groups.

A portable remote telephone oscilloscopic computer terminal allows one to sit and choose site, type, treatment, etc., and obtain immediate answers to the physician's specific questions.

Results

The cancer problem has been surveyed and data gathered establishing local baselines regarding incidence and survival. A total of 52,000 cases have been registered from 112 hospitals. A rigorous follow-up program has been undertaken with the following results in Utah: 95 per cent of all follow-up letters have been returned, representing participation of almost all physicians in the follow-up program. Of the first 451 patients referred to the Utah public health nurse consultant 105 have been returned to medical care; 12 were found not to have been lost; 156 were under a physician's care, but a different physician than originally treated them; 10 patients refused to return to a physician; 84 patients were found to have expired; and 61 patients could not be located. At the present time there are 25 incomplete referrals.

The medical profession has been served in the following ways:

1. 78 per cent of the physicians caring for cancer patients in the State of Utah have requested and are receiving their individual office cancer registries on a regular basis.

2. Statewide Cancer Coordinating Committees were organized consisting of representatives of the State Medical Association, the American College of Surgeons, the American Cancer Society, the State Division of Health and other medical and paramedical

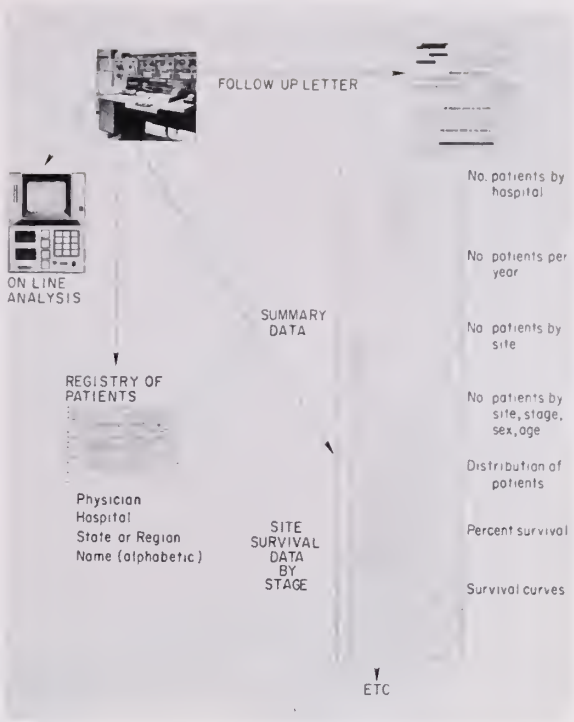

Figure 1

organizations in each state. They advise on matters of policy, patient confidentiality, publications and research.

3. Medical specialty organizations, including the Academy of General Practice, have organized cancer committees to analyze the Central Registry data on a specific cancer site. Every other month one site is reported in the *Rocky Mountain Medical Journal.* Articles have been published on the following sites: Lung, Cervix, Breast and Stomach. These articles have attempted to answer the questions: Where are we? Where should we be? How can we get there? The recognition of a problem by those groups puts the problem in the hands of those most able to correct it. These articles should act as a catalyst in solidifying thought, formulating action, and declaring conviction to physicians in the Rocky Mountain Area. These cancer committees also select the references for the computer reports.

4. The American Cancer Society, Utah Division, in conjunction with the Deseret News, is sponsoring a series of large monthly lay education meetings entitled. "The Physician Talks on Cancer in Utah." These talks have utilized Utah Tumor Registry data.

5. The Utah State Division of Health devotes certain publications to the cancer problem as mirrored by the cancer registry. This is distributed to all physicians as well as health personnel in the schools and other health facilities.

Summary

In summary, there are a great many factors playing a role in the success or failure of tumor registries, simply having a registry computerized is no guarantee of success. It requires good hospital records, adequately trained and dedicated tumor registry secretaries or field workers, current abstracting, accurate coding and keypunching, quality controls and current follow-up letters. It requires good computer programs that can produce survival reports useful to physicians in patient care. Even though all of the above work perfectly, it may still fail through lack of physician involvement. Our experience would suggest that one significant advance that could presently be made against cancer would be an effective system of assuring a continuity of patient re-examination and care in the physician's office. It is in this area that this Rocky Mountain States Cooperative Tumor Registry hopes to assist the physician. •

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Percutaneous subclavian vein cannulation*

Ray G. Witham, MD, Craig, Colorado

This useful technic is worthy of your consideration if you will closely follow a few basic principles.

DURING THE PAST YEAR, interest and controversy has been expressed about the use of percutaneous subclavian cannulation.[1] The publication quoted has three papers discussing this method, all with mixed views of its safety and value. Many other communications and personal discussions either condemn the technic or support it as a useful tool in critical care.

The procedure has immediate appeal, particularly in the isolated rural community where lifesaving methods are of prime importance. We have adopted the technic and feel that if one is aware of the indications and the dangers it can be of value.

Every practitioner in the small community, distant from large sophisticated medical centers, is well aware of the frustrations of insuring consistent parenteral fluid administration. Collapsed veins, dislodgement of intravenous needles and catheters, and the time consumed in cut-down procedures is the bane of every practitioner doing critical care. The increasing importance of measuring central venous pressures in the care of the critically ill,[2] plus the importance of adequate venous blood samples for laboratory determinations, further emphasizes the need for a well placed intrathoracic catheter.

*From the Memorial Hospital, Craig, Colo.

Like many other worthy treatment methods, precise application of the method has its reward while failure to do so can be disastrous. If one will utilize some simple rules based on common sense, one can use this important tool in his care of the critically ill patient.

We would like to detail our conclusions after twenty-five successful percutaneous subclavian cannulations out of twenty-six attempted without serious complications in a small community hospital with twenty-five beds during the past six months.

INDICATIONS AND ADVANTAGES

1. Inability to cannulate extremity veins rapidly.
2. Central venous pressure monitoring.
3. Need to take frequent blood samples.
4. Ability to administer large volumes of fluid rapidly.
5. Long term intravenous fluid administration.
6. Ability to give high caloric fluid mixtures.
7. A guide for temporary transvenous passage of pacing electrodes.

DANGERS AND DISADVANTAGES

1. Air embolism (may be massive and fatal).
2. Catheter breakage at the intracardiac level.
3. Hydrothorax.
4. Pneumothorax.
5. Septicemia.
6. Cardiac wall perforation.

We believe that all of these rather serious complications are preventable by attention to a few basic rules.

EQUIPMENT (SUBCLAVIAN TRAY)

1. 5 cc. syringe.
2. 10 cc. syringe.
3. 25 gauge needle.
4. 22 gauge needle.
5. Large 12" Intracath (14 gauge needle).

6. Antiseptic cup with Betadine antiseptic solution.
7. Applicator sticks.
8. Gloves.
9. Needle holder.
10. 3-0 silk on curved cutting needle.
11. Xylocaine 2 per cent plain.

All of above is sterile. It is realized that each facility will have its preferences, but since it is the designed purpose of the paper to outline a precise technic, the above is recommended.

Technic

Position patient in a head down position. This is of prime importance, and insures the prevention of the most serious complication, that of air embolism due to negative pressure. The foot of the bed is elevated at least ten inches by the use of shock blocks. The foot and knee supports of the usual type hospital bed are also raised to their maximum. The head is further depressed by removal of the head pillow. Never attempt the cannulation until there is assurance that the body is in the dependent position.

We like to approach the patient from his right for two reasons: 1. Most of us are right handed and it seems more natural. 2. The distance to the right atrium is shorter if one desires to achieve this distance. (The superior vena cava level is satisfactory, however.)

Turn the patient's head to the left and elevate the shoulder girdle. This creates a more superficial position of the axillary subclavian vein junction, and places the vein in an optimum position for introduction of the needle into the vein. Antiseptically prepare the area. Shave hair if necessary, wash with Phisohex, and rinse with alcohol. Paint the entire clavicular shoulder area with Betadine, and drape with towels, being careful to insure that asepsis is achieved as well as maintaining visibility of important anatomical surface landmarks. We like to see the entire length of the clavicle as well as the supraclavicular area to the superior trapezius border to the infraclavicular pectoral region inferiorally. Medially, the neck from chin to suprasternal notch should be visible, and laterally, the anterior axillary fold should be in view.

Preparation should be made with the instruments on the tray for rapid interchange of materials. The large Intracath is separated into two units and the plastic guard is removed from the needle to insure maximum penetration of the needle. The stylet is also removed from the catheter. The 14-gauge needle is snugly attached to the 10 cc plain tip syringe and the attachment tested to insure an air tight fit, but loose enough that easy separation can be made at the appropriate time.

The anesthetic solution is injected as a skin wheal into the most superficial aspect of the inferior clavicle. This is usually at a point in the medial portion of the clavicle. If one will select that point in the clavicle where it seems most superficially visible and feels the most hollow point in the immediate infraclavicular area, one will be at the optimum point. After the skin wheal is raised, the infiltration is carried to the periosteum of the inferior portion of the clavicle. With the 22 gauge needle, further infraclavicular infiltration of the area is made penetrating close to the periosteum in a medial and superior direction.

The 14-gauge Intracath needle separated from the catheter is attached to the 10 cc syringe and then inserted into the wheal with the bevel of the needle turned upward. The bone edge is sought and intimately adhered to during the slow penetration of the needle. The bone is hugged by the bevel of the needle and strong suction maintained. After contact with the inferior border of the clavicle, the syringe is depressed tightly to the chest wall, depressing the skin with the syringe as the needle is visualized advancing in close continuity with the inferior border of the clavicle. To attempt to verbalize this description further, one should make attempts to press the needle upward on the inferior portion of the clavicle. No attempt is made to penetrate deeper than the bone will allow. The needle is slowly advanced medially and posteriorally in a gradually oblique manner toward the root of the neck. We pay no attention to the exact direction of the needle except as it is related to the bone surface itself as described above. We visualize, during the gradual penetration of the needle, the

vein to lie in a slightly posterior plane with the inferior portion of the clavicle near the sterno-clavicular junction and feel for this general area. Usually, the entire length of the needle is needed before the vein is entered in the adult. A very rapid reflux of blood is obtained when the vein is penetrated. The needle is then advanced to a point estimated to be the length of the bevel and the needle rotated 180° to place the bevel in an optimal downward position. The syringe is then disengaged from the needle and the polythene catheter without the stylet is rapidly inserted into the needle to its full length and snugly fitted to the needle hub. The needle is rapidly withdrawn and another withdrawal of blood with syringe made to insure that the catheter is properly placed.

Two points need emphasis. First, if the polythene catheter cannot be passed easily to its full length, the cannulation must immediately be stopped with withdrawal of *both* the needle and catheter, since withdrawal of just the catheter could sever the catheter tip. Secondly, if blood is not obtained immediately the second time, the catheter must be removed since it cannot be properly placed.

After successfully obtaining blood the second time, the infusion tubing is attached. A stitch is then placed in the skin at the point of entry of the catheter and wrapped around the catheter a few times and tied to insure its secure position. A three-way stopcock can then be attached to the hub and infusion tubing if central venous pressure monitoring or further removal of blood samples is planned. All of the attachments should be snugly taped at the connecting points. Firm taping of the catheter and needle are then made to the chest wall. We like to have about two inches of the 12-inch catheter visible. The infusion tubing is most conveniently brought out through the neck of the gown. One of the distinct advantages of the technic has been the improved mobilization of the patient.

Clotting within the tubing is of some concern particularly when frequent central venous pressure monitoring is ordered with the usual devices available. We have found that when it occurs, the entire length of the tubing is clotted and it is not possible to dislodge the clot and remove it. For this reason we recommend routine heparinization of the solution using a formula of one unit of heparin to one cc of solution.

Careful attention to asepsis is further adhered to by removal of all tape every twenty-four hours, washing the skin with Phisohex and reapplication of Betadine with particular attention to the junction of skin and catheter. We do not rely on use of antibiotic ointments, thinking it is a lazy substitute for good mechanical cleansing and prevents good tape adherence. •

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Acute coronary care--1970

Robert J. Barnet, MD,* Reno, Nevada

Up to date knowledge and technics in the modern management of acute myocardial occlusion are summarized.

SINCE THE IDEA of specialized coronary care facilities was first introduced by Doctor Hugh Day,[1] there has been a general acceptance of the concept. Such units undoubtedly have resulted in a significant decrease in the mortality from approximately 30 per cent to between 15 and 20 per cent. This reduction in mortality has been primarily through the prevention of ventricular fibrillation and other serious arrhythmias, combined with the prompt termination of ventricular fibrillation when it does occur. Today the more successful units are marked by relatively infrequent episodes of primary ventricular fibrillation. A significant number of patients, perhaps 10 to 15 per cent of those hospitalized with acute myocardial infraction, continue to die. The majority of these are patients who have severe and advanced disease, usually presenting in cardiogenic shock.

Probably the only really successful approach to the patients who still die after they reach the hospital is a long range preventive program that would reduce the risk factors. When a patient reaches the hospital with an acute myocardial infarction in the presence of extensive three vessel disease, the reversal of the pathological process is extremely unlikely, and the survival of the patient in serious doubt. The prevention of these deaths must not begin at the time of hospitalization but many years before with a program which will prevent the progressive atherosclerotic changes.

In the last year there has been emphasis on the fact that the coronary care units are only part of the answer to the problem of coronary deaths in the United States today. Some 50 to 60 per cent of patients who die of coronary artery disease, die *prior* to reaching the hospital. The majority of these die in the first few minutes, presumably of ventricular fibrillation. Many of these patients have had premonitory symptoms but have not sought nor obtained medical care. The reasons for this situation, and possible solutions, are now being evaluated both through more extensive epidemiological studies and through the data being gained from the mobile coronary care units first popularized by Pantridge in Belfast.[2]

Certainly, an intensive educational program is needed to make the coronary prone individual aware of the problems involved. This must be a balanced approach to prevent emotional panic. The training of ambulance personnel to use monitoring and defibrillation equipment is the next logical step. This

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must be coupled with an educational program that would include not only the potential victim, but his family and the medical profession as well.

Graduate Care Units

Current knowledge suggests that any patient with a significant myocardial infarction should be monitored from 7 to 10 days. Even the early figures reported from coronary care units, in which the "majority" of deaths were said to have occurred during the first 72 hours, showed only a bare majority. In fact, some of the early figures showed slightly more than half of the patients died *after* 72 hours.

Experience over the past several years has shown that there is need for modification of the standard intensive coronary care approach. The fact that there is a significant mortality beyond the first five days of hospitalization has made it imperative to develop methods of long term monitoring. The emotional stress and high expense involved in keeping patients in the usual intensive care setting for more than a few days has caused development of the "graduated care unit." These have been integrated with intensive care units or into the general medical wards. In this type of unit, with more privacy, the patient is able to be in a more normal hospital setting but continues to be constantly monitored and under the care of specially prepared nursing personnel. Since a significant mortality occurs, even in good risk patients, through at least the 14th day of hospitalization, the advantages of having the patients in special units under the scrutiny of nurses acutely attuned to the treatment and management of cardiac emergencies and complication is obvious. Some cardiac care units which provide monitoring on all beds are divided into sections for critically ill patients, patients under observation, and the patients in their recovery or convalescent stages. The telemetry monitoring of these patients certainly merits consideration.

The designation of the cardiac units as a cardiac care unit, rather than a coronary care unit, emphasizes the importance of the unit in the care of not only patients with acute myocardial infarction, but rhythm disturbances, congestive heart failure, and other complications of cardiac and pulmonary disease. The specialized nursing staff assumes great importance because of their knowledge of the use and complications of cardiac drugs, their ability to detect early signs of congestive failure and their ability to deal with all aspects of the cardiac patient, both emotional and physical.

Following is an outline containing some of the current concepts which find general acceptance in the care of the patient hospitalized with acute myocardial infarction.

General Supportive Care

1. **I. V. LIFELINE.** Perhaps the most important routine procedure in the management of the patient with acute myocardial infarction is the utilization of the "intravenous lifeline." In most units it is the practice to insert an intravenous catheter on admission in all patients, utilizing 5 per cent dextrose and water run at slow rate. This provides a rapid means of injection of life-saving drugs for the prompt treatment of arrhythmias, as well as a ready route for intravenous medication in case of acute emergencies such as cardiac arrest. Almost all patients are able to tolerate 500 cc. for a 24-hour period without difficulty. The majority of patients on admission to a cardiac unit have restricted their fluid intake for at least several hours and many are vomiting and sweating. These factors, along with continued insensible loss, more than compensate for the amount of fluid that is given. However, in patients with congestive heart failure and decreased renal function, caution is indicated.

2. **NARCOTICS.** Pain or "discomfort" is the most common reason for patients with acute myocardial infarction to seek medical aid. Control of pain is critical to ameliorate anxiety. Continuing pain can aggravate hypotension and is associated with increasing output of catacholamines. Narcotics continue to be favored by most physicians in the patient with myocardial infarction. The use of morphine has significant disadvantages including a high incidence of nausea and vomit-

ing, bradycardia, marked respiratory depression, tendency to hypotension, and decreased AV conduction. Administration of morphine in the range of 4 to 8 mgs. rather than the more common 15 mgs. is apt to produce fewer complications. It is perhaps advisable to administer atropine in all instances in which morphine is used. Meperdine, when given in adequate dosages, is effective and associated with fewer of the side effects, although its duration of action is shorter. The disenchantment some physicians find with meperdine is from use of inadequate dosage or failure to realize that its effective duration of action is 2 to 3 hours.

3. **BED REST.** Rest is a reasonable part of the management of the patient with a damaged myocardium. Activity will increase the work load on the heart. During the active healing process restricted activity is indicated. There is ample physiologic evidence that the patient sitting upright in the chair suffers no adverse effect. Cardiac outputs in patients in the supine and upright positions are not significantly different from normal if the patient has had a myocardial infarction without evidence of cardiac decompensation. Groden, however, has shown in a group of patients with congestive heart failure and myocardial infarction, that there is a significant increase in cardiac output due to increased stroke volume if the patient is placed in a sitting position.[3] because of decrease of work load on the heart from decreased venous return. This more recent data re-emphasizes the admonition of Samuel Levine, that every effort should be made to treat the cardiac patient in the chair. One practical problem is that many hospital chairs are too uncomfortable to be tolerated for a long period of time. "Contour" chairs, in which the patient can be readily monitored and still sit up comfortably, are available through normal retail channels at approximately the same price as the conventional, uncomfortable, straight back hospital chair.

The problem of keeping the patient in the hospital during the three-week period that is usually indicated and still allowing some freedom of activity is a delicate one. Once the pain and acute symptoms have subsided it is difficult to convince many patients that continued restriction of activity is necessary. To communicate to the patient the need for temporary restriction of activity without making him an iatrogenic cripple in the future is often a severe test of the physician's ability.

4. **DIET.** During the first 48 to 72 hours of hospitalization it is important to markedly restrict the solid food intake of patients with acute myocardial infarction. A common cause of failure in resuscitating the hospitalized patient with primary cardiac arrest is the aspiration of stomach contents. In addition, there is an increased work load on the heart by large food intakes. Cooperation by the dietitian, physician, and nursing staff can make the hospital stay a valuable learning experience both for the patient and his family if weight reduction, low saturated fat diets are introduced at this time.

5. **OXYGEN.** Although there is still considerable debate about what effect continuous oxygen therapy may have on the pathologic process, it continues to be a standard part of the treatment of myocardial infarction. Higher level of oxygen can probably be delivered by mask when compared with intranasal catheters, but this must be balanced with the stress on the patient and the difficulty in feeding and care of the patient created by the use of the mask. Oxygen under intermittent positive pressure seems reasonable in a patient with congestive heart failure and pulmonary edema since it increases arterial oxygen tension. This, combined with the rapidly acting diuretics, is perhaps the most important phase of the initial treatment of the patient with acute pulmonary edema.

6. **TOURNIQUETS.** Venesections have largely been supplanted by the use of rapidly acting diuretics such as ethacrynic acid and furosemide. Tourniquets continue to have a limited temporary use in the patient with acute pulmonary edema while awaiting the effect of these diuretics.

7. **VITAL FUNCTIONS.** The use of stool softeners or mild laxatives on a routine basis will often prevent some of the discomfort

that occurs when the patient is restricted in activity. In general, the use of the bedside commode is indicated. It is important to realize that, particularly in an elderly patient, the use of the rapidly acting diuretics or atropine may result in acute urinary retention.

8. **ANTICOAGULANTS.** There is little evidence to document the thesis that the use of anticoagulants will reverse the pathologic process in the coronary arteries. The fact that a significant number of coronary occlusions occur because of a "hemorrhage into a placque" certainly raises the possibility that anticoagulants may have, in fact, an adverse effect. The prevention of mural and peripheral thrombi is the most important reason for the use of anticoagulants in the patient with acute myocardial infarction. Not only a significant mortality, but also morbidity from peripheral and central nervous system emboli, occur in the presence of mural and peripheral thrombi. Anticoagulants for these reasons remain a routine procedure by many cardiologists. The complications of anticoagulants are most likely to occur when the prothrombin time exceeds 25 seconds. Adequate anticoagulation levels can probably be maintained with levels between 20 and 25 seconds. Combining with anticoagulants the routine use of elastic stockings and the encouragement of active leg and toe movements, will virtually eliminate the thrombotic complications.

Cardiac Arrhythmias

Since the introduction of coronary care units in the early 1960's, a major change has been the aggressive management of cardiac arrhythmias. Coronary care units have changed from units in which emergency situations such as cardiac arrest were anticipated and immediately dealt with, to units in which the serious arrhythmias are prevented by the early treatment of the less serious premonitory arrhythmias, and the early aggressive management of complications such as congestive heart failure and shock.

1. **VENTRICULAR ARRHYTHMIAS.** Ventricular arrhythmias are the most common type encountered in the coronary care unit. Over 75 per cent of patients who develop ventricular tachycardia and ventricular fibrillation have had preceding ventricular premature beats. If these premature beats are suppressed the incidence of more serious arrhythmias drops precipitously. The drug of choice today for the treatment of this ventricular irritability is lidocaine. Standard procedure is to inject intravenously 50 to 100 mgs. rapidly (2½ to 5 cc. of 2 per cent lidocaine). To prevent recurrence it is customary to start a continuous infusion in the range of 1 to 3 mgs. per minute. Supplemental injections of 50 to 100 mgs. can be given as needed approximately every 5 minutes. The only significant side effects reported are central nervous system irritability, although this drug should be used with some caution in patients who have AV block because of the possible adverse effect on AV conduction. Since lidocaine is metabolized almost completely by the liver, particular caution should be used on the patient with significant liver disease.

Procaine amide is the most commonly used drug in cases of ventricular irritability which is refractory to lidocaine. In a resistant ventricular tachycardia the use of DC counter shock, however, is indicated.

2. **BRADYARRHYTHMIAS.** Sinus bradycardia is a common occurrence in patients, particularly those with inferior wall myocardial infarctions. A slow heart rate is associated with decreased cardiac output, as well as increased electrical instability. "AV junctional rhythms" are a common occurrence as an escape mechanism. The use of atropine, 1.0 to 1.5 mgs. intravenously, will usually result in a significant increase in the heart rate with enhancement of cardiac function and disappearance of the escape rhythms. Isoproterenol (1 mg. or 5 cc. in 1000 cc. of 5 per cent dextrose and water) can also be utilized to "overdrive" the ventricle in the presence of bradyarrhythmia or AV block. This, however, is often associated with increased ventricular irritability. The third method of dealing with the bradyarrhythmias is a temporary transvenous demand pacemaker, which perhaps takes precedence over the use of isoproterenol if there is failure to correct the condition with atropine.

3. **ATRIAL ARRHYTHMIAS.** Atrial premature beats occur in 15 to 20 per cent of the patients with a myocardial infarction. Atrial arrhythmias are often associated with congestive heart failure. Digitalization is the procedure of choice. Digoxin is sufficiently rapid in onset that it is adequate in most instances. The dosage utilized is uniform regardless of the route of administration. The realization that digitalis does not work in an all or none way, and that relatively small doses have a beneficial effect, can prevent many of the complications that were reported when dosages approximating toxic levels were utilized. A good plan in an adult is to begin with approximately 1 to 1.5 mgs. of digoxin and place the patients on maintenance doses of 0.25 mgs. a day.

It is important to realize that in patients with acute pulmonary edema, digitalis has a transistory peripheral vasconstrictive effect that may temporarily increase the work load on the heart, and actually produce aggravation of the pulmonary edema. For this reason, particularly in the patient with acute pulmonary edema, small increments of no more than 0.25 mgs. should be given at a time, while utilizing the supportive measures of positive pressure oxygen, diuretics, and tourniquets

In the presence of rapid supraventricular tachycardias associated with comprised circulation in which there are obvious signs of significantly diminished cardiac output, such as hypotension, mental confusion, and subjective distress, precordial DC countershock is generally the treatment of choice. However, the fact that many of these patients have *recurrent* arrhythmias requires the administration of preventive therapy such as digitalis once the DC countershock has been administered and the arrhythmia initially terminated. If the patient is refractory to the use of digitalis there is some reluctance to utilize DC countershock. If he is adequately oxygenated, and measures have been taken to prevent or correct acidosis, the use of an intravenous drip of potassium chloride will usually allow one to safely administer precordial countershock even in the presence of preceding digitalis. An alternative in this situation is the use of intravenous propanolol which will produce significant slowing of the ventricular rate in almost all instances of supraventricular tachycardias. However, in the patient with myocardial infarction, it is recommended that prior or concurrent digitalization be considered.

4. **AV BLOCK.** Atrial-ventricular block is common in patients with inferior wall infarctions. First degree block often precedes more advanced block, and should be observed closely. The use of atropine, because of its efficacious effect on AV conduction, may be utilized. All patients who develop second degree block can be given intravenous atropine, and if this does not produce prompt results, then both these patients and those who develop complete AV block should have a transvenous demand pacemaker put in place.

Complications

The majority of patients dying of acute myocardial infarction today are patients who have significant congestive heart failure or shock. Mortalities in the range of 65 to 86 per cent continue to be reported.[4] The majority of these patients at the time of autopsy show advanced multiple vessel involvement and are often patients who have had documented pre-existing disease. The management of patients with congestive heart failure *alone* is more rewarding. Many of these patients will respond to the usual regimen of digitalization, oxygen therapy, and diuretics. The patient in shock continues to be a dilema. Because of the underlying pathologic process, shock patients develop a decreased cardiac output. This is associated with peripheral vascular collapse. To attempt to correct the obvious manifestations of the underlying problem (that is, low blood pressure) may actually aggravate the condition. We can raise the systemic blood pressure by increasing peripheral resistance. This will result in an increased work load on the heart. Blood pressure levels adequate to maintain coronary artery profusion are necessary. Therefore, the use of vaso-pressor drugs such as levarterenol and metaraminol are indicated only on a temporary basis to obtain blood pressure levels to maintain coronary artery profusion. The use of ionotropic agents such as digitalis, and perhaps more suitably,

isoproterenol, are indicated to improve myocardial function. Isoproterenol, unfortunately, is associated with significant cardiac irritability. It may be possible with the new drug, dopamine, to maintain adequate systemic pressure, and at the same time obtain some ionotropic effect. If this drug is used in a combination with isoproterenol, both may be used at somewhat lower dosage levels and the vasodilatory effect of the isoproterenol may balance the vaso-constrictive effect of dopamine. Dopamine has the additional advantage of increasing renal blood flow. This drug in a combination with isoproterenol is undergoing evaluation that offers promise of the type of therapeutic approach that may develop. The use of the central venous catheter has an important role in the patient with cardiogenic shock. Many of these patients are hypovolemic and may actually need additional fluid loads. A very effective way of managing many of these patients is the use of the "fluid challenge" in which the patients are given 200 to 300 cc. of intravenous fluid rapidly and changes measured in the central venous pressure. It is possible for patients to have normal central venous pressures at the time that their cardiopulmonary blood volume is actually low. A central venous pressure may also be useful in certain patients who are developing congestive heart failure in which rise in central venous pressure may be an early helpful clue.

The Nurse In Cardiology

The knowledge that specially prepared nurses are assuming even more important roles in the care of the cardiac patient has been only gradually accepted by many members of the medical profession. Certainly professional pride blinds many of us to the realization that many nurses today working in cardiac care units are more knowledgeable than many physicians. These nurses are with the patients constantly and see a large number of patients over long periods of time. The fact that the nurse plays a vital role in the care of the cardiac patient can no longer be argued. First of all, because seconds are important and because physicians are not immediately available, nurses must necessarily begin and be able to adequately perform cardio-pulmonary resuscitation and defibrillation. Realization that the early management of cardiac arrhythmias is often critical has resulted in the increasing practice of having nurses initiate treatment of certain arrhythmic complications, such as multiple ventricular premature beats, under standing orders.

The fear that many people expressed some five or six years ago, that the nurse in the cardiac unit faced with multiple monitoring equipment would begin to lose touch with bedside nursing, has not occurred. Quite the contrary has happened. Most nurses in these special units have become even more vitally interested in the patient and their medical and personal problems and needs. Rather than substitution, they have built on their responsibility for the nursing care of the patient. Not only have they learned to recognize the normal and abnormal of the electrocardiogram, but have acquired growing knowledge of the cardiac drugs and their adverse effects, as well as becoming aware of the implications and early signs of shock and congestive heart failure.

We find it appropriate for the nurse in the cardiac unit to form an assessment and judgment of the patient's state and to be able to adapt routine nursing procedure to the situation, as well as to anticipate the special therapeutic measures that may be necessary, and while notifying the physician, to ready these procedures.

The fact that the nurse is with the patient constantly during his period of hospitalization, makes her extremely important not only for the actual clinical management of the patient, but for the rehabilitation and educational process of the patient which begins from the date of hospitalization. The nurse is extremely valuable in working with the patient, the doctor, and the family in the future plan of management. The nurse can assume important roles in helping the patient understand the pathologic process, its implications, and what he can do in the future for the reduction of risk factors. An interested and understanding nurse is important in relieving the anxieties that any patient with myocardial infarction *realistically* experiences. The idea, occasionally expressed, that

the patient should not be monitored because it "might upset him" shows complete misunderstanding of the dangers involved, and lack of appreciation of the fear that any of these patients face. On the cardiac unit, perhaps, more so than anywhere else in the hospital, the nurse must be able to cope with these fears. For the physician to make known to the patient and his family that he considers the nursing staff part of the team on whom the patient will be able to rely in time of emergency, will give both the patient and his family a realistic sense of security.

Routine Administrative Orders

It is desirable to have guidelines for the operation of coronary care units. The following are examples of the type that have been useful:

1. All patients admitted to monitored beds with "suspect" or confirmed myocardial infarctions will be monitored.

2. All patients admitted to monitored beds will have an intravenous of 5 per cent dextrose and water started with an indwelling catheter and to be run at 25 to 50 cc. an hour unless an order is written to the contrary.

3. The following bed priority will apply: Patients in Number 1 priority will take precedence over patients in Number 2 priority. If it is necessary to move a patient from a monitored bed in category 2A or 2B, these patients will be kept in the intensive care unit in a non-monitored bed. (*This priority assumes that the greatest benefit is to be derived if the monitored beds are used for patients who are in "good risk category," particularly during the first 72 hours after onset of symptoms. If a patient has shock or has not responded in 12 hours and the likelihood of being able to alter his course is minimal, this bed, if needed, should be utilized for a patient who has a high likelihood of developing a series of arrhythmias but in whom the survival is highly likely if the arrhythmias are controlled.*)

Number 1 priority: (a) Patients under the age of 65 with suspect myocardial infarction within 72 hours after the onset of symptoms. (b) Confirmed myocardial infarction during the first five days after the onset of symptoms or three days following a major arrhythmia. (c) Arrhythmia or conduction disturbances which may require monitoring.

Number 2 priority: (a) Myocardial infarction in a patient complicated by shock or pulmonary edema which persists beyond 12 hours after admission. (b) Myocardial infarction in a patient with debilitating or complicated disease in which survival is unlikely. (c) Any patient monitored for seven days who has had no significant arrhythmia for at least five days.

(*This, of course, does not include all patients, but only separates the patients into groups who have top priority and of those who would be required to be moved if a "priority #1" patient requires admission.*) If attending physicians will anticipate on a day-to-day basis and inform the nurse which patients they would prefer to have transferred, it may not be necessary to invoke the following procedural rules: (a) The nurse will notify the physician of any patient in Category 2 if a bed is needed for a Category 1 patient. (b) If the attending physician does not concur with the transfer of the patient, the nurse will notify the director of the coronary unit who will confer with the attending physician of the patient in Category 2. (c) If the attending physician does not concur with transfer, then, as a check and balance, the director of the coronary unit will confer with the Chief of the Department of Medicine. If both concur, the patient of Category 2 will be transferred. Patients in Category 2A and 2B will be kept under intensive or special nursing care, depending on bed availability elsewhere. Patients in Category 2C will be transferred to a general medical bed.

Routine Coronary Care Orders

The following is an example of the type of orders used in some hospitals for all patients admitted to a coronary care unit:

1. Monitor patient.

2. On admission start an intravenous of 5 per cent dextrose and water to be run with a micro drip at 25 cc. an hour.

3. In the event of cardiac arrest, the nurse may: (a) Defibrillate at 400 joules in the event of ventricular fibrillation. (b) Immediately give 44 MEQ of Soda Bicarbonate and repeat in 5 minutes. (c) Add 500 mgs. of lidocaine to each 500 cc. of intravenous dextrose and water at indicated rate.

4. In the absence of bradycardia and AV conduction defects, and if ventricular premature beats occur under the following conditions in a patient who has myocardial infarction, the nurse will give 75 mgs. of lidocaine by intravenous bulous and start a continuous drip of 500 mgs. of lidocaine in 500 cc. of dextrose and water to be run at a rate between 1 and 3 mgs. per minute as necessary to control the premature beats. (a) Five or more ventricular premature beats per minute. (b) Multi-form ventricular premature beats. (c) When ventricular premature beats occur in runs of two or more. (d) When the R-wave of the premature beat falls on the T-wave of the preceding beat.

5. Liquid diet for first 72 hours.

6. Elastic stockings.

7. Vital signs every 4 hours.

8. Pulses will be taken both apically and radially.

9. Chest x-ray on admission.

10. Electrocardiogram and serum enzymes on admission and daily x 3.

11. Stool softener daily.

12. Bedside commode as tolerated.

Newer and Less Frequently Used Drugs

There are several other drugs which are being mentioned for use in the patient with acute myocardial infarction.

1. **PROPANOLOL** is a beta adrenergic blocking agent. It will decrease the sympathetic activity and work load of the heart. Its effect on decreasing the work load of the heart is accomplished by decreasing the heart rate and to a lesser extent by decreasing blood pressure. It has a "quinidine like" effect and will decrease AV conduction. There is some evidence that it may prevent sympathetic nervous system induced necrosis in the myocardium. Because of its adverse effect on the myocardium, which include compromising cardiac function and the possible production of heart block, there are significant, although relative, contraindications to its use. These include overt or latent cardiogenic shock and significant pulmonary disease. Its main role in the patient in a coronary care unit is for atrial arrhythmias with rapid uncontrolled ventricular rates. It also may be useful in digitalis toxicity with atrial tachycardia. (Although it has been tried, the results have been more variable in refractory ventricular tachycardia.) If arrhythmias such as sinus or ventricular tachycardia have been produced by catecholamine administration, this is an important drug to consider. It can be given intravenously in doses of 1 to 5 mgs. but should not be given at more than 1 mgs. every 5 minutes. Its duration of action is 3 to 6 hours. The patient should be observed closely for the development of congestive heart failure.

2. **BRETYLIUM** is being used experimentally in patients with refractory ventricular fibrillation. It appears to work primarily by prevention of re-entry arrhythmias. It will decrease the refractory period and increase conduction velocity. The unique theoretical value of bretylium is that it *increases* cardiac contractility. Because of this effect its use in a phophylactic role for the prevention of ventricular arrhythmias has been given some consideration.

3. **DOPAMINE,** which was mentioned above, is a precursor of norepinephrine under experimental use in cardiogenic shock. It increases cardiac output and arterial pressure while at the same time increasing renal blood flow. There is some increase in automaticity with this drug as well as some increase in heart rate.

4. **GLUCAGON** is a potent ionotropic agent undergoing clinical evaluation at the present time but appears markedly limited by the fact that patients receiving it intravenously develop severe nausea and vomiting. Its effect is only transitory. The original data on this drug was derived from animal experimentation in dogs. It seems to

have a less dramatic effect when used on man in a clinical setting. An advantage of this drug is that there is no increased automaticity. Its role, if established, would be in the patients in cardiogenic shock as an inotropic agent.

5. **DILANTIN**, although not a new drug, has been suggested as an effective antiarrhythmic agent, particularly in digitalis induced arrhythmias. The results of this drug are mixed and significant cardiac depressant effect, sudden death and venous thrombosis at injection sites have been reported.

6. **EDTA**, a chelating agent, has value in patients with myocardial infarction and digitalis toxicity. •

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[4] Killip, T. M., Kimball, J. T.: Treatment of myocardial infarction in coronary care unit. A two-year experience with 250 patients. Amer J. Cardiol. 20; 457, 1967.

ADDENDUM FOR 1970 ROCKY MOUNTAIN MEDICAL DIRECTORY

The following incorrect listings have been called to our attention. Please make these changes in your office copy of the Directory for reference during the year.

COLORADO

Denver

Daniels, Luman E; 980 Grant St; 825-5425; N* (PP)
Danielson, Ralph W; 5770 E 3rd Ave; 377-0644; Ret.
Long, John C; 1215 Monaco Pkwy; 377-1119; Ret.

Englewood

Donovan, Mark S; 3975 S Cherry St; 758-0981; R*

Greeley

Dunn, Thomas R; 1801 17th St; 353-1551; PD* (PP).

Westminster

Goedert, Lawrence W; 7280 Irving St; 429-4922; ObG* (PP)

NEW MEXICO

Albuquerque

Parkes, Gerald; 625 Silver Ave SW; 842-8400; OM
(Omitted from Directory)

Espanola

Cutler, Robert E; PO Box "DD"; 753-7121; IM* (PP)

Las Vegas

Davison, C L; Las Vegas Med Plaza; 5th & National; 425-5874; ObG* (PP)

Santa Fe

Higgins, Robert S; PO Box 2401; 983-3275; ANES* (PP) OI

Obviously, we cannot attempt to publish the numerous changes that come in after the annual Directory has been published, but if corrections are to be made for the 1971 issue, it is important that you send accurate information direct to the Journal office.

CORRECTION FOR PAGE 82 in your 1970 ANNUAL DIRECTORY

UTAH STATE MEDICAL ASSOCIATION ANNUAL MEETING DATES - SEPTEMBER 8-11, 1970

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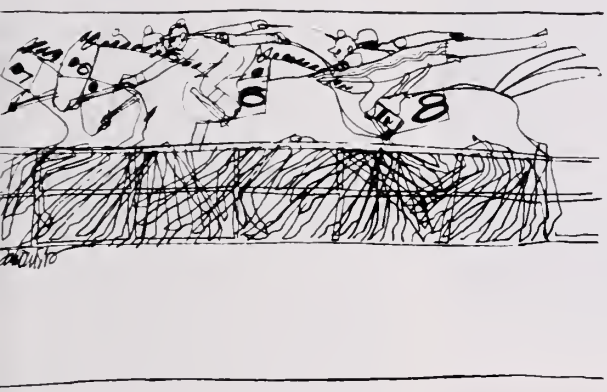

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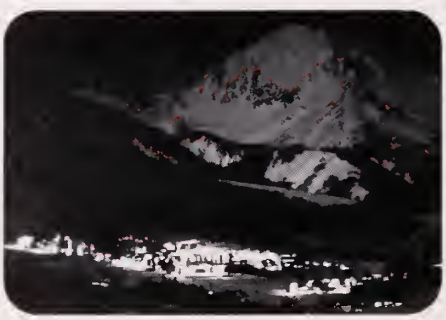

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"I know you believe you understand what you think I said, but I'm not sure you realize that what you heard is not what I meant."

It happens every day! Communications are garbled because people have pre-conceived ideas about what you are going to say . . . . . or you have assumptions about people, and it influences what you hear. Sometimes the results are sad. Sometimes they are funny. And sometimes frustrating. "Understanding how you affect communication with others" is the title of the first morning's session. It starts to unconfuse things.

"Forget what is said, just remember to hear what is meant."

"I know that's what Dr. Adams said, but I think what he meant was . . ." Ever heard that before? Or, how about this: Wife: "Do you like my new dress?" Husband: "Yes." Wife: "What do you mean by that?" Husband: "I mean I like it." Wife: "It didn't sound like you meant you liked it." Husband: "Now you made it sound like I don't like it." Wife: "Do you?" Husband: "Yes." Wife: "What do you mean by that?" Etc. etc. Theme of the second morning, "Understanding how others affect communication." It starts to clear away some of the communication smoke screens.

What do you say after you say "Hi, Honey!" What do you say after you say, "How was school today?"

It's been said that "a family that prays together, stays together." The same thing might be said about a family that communicates. How does your family communicate? Do communications flow from father on down? Do they flow from father *and* mother on down? Or, is there a free exchange in both directions? The third morning session gives you the tools to examine and improve family communications. There are creative exercises, spirited friendly competition with other families and free wheeling discussions. It's great fun, and will probably be your favorite session.

"Communication, the transfer of meaning."

Snowmass' colorful and glamorous dinner spots will tempt you to stay on into the evening. But if you do, you'll miss perhaps the most exciting, stimulating and thoroughly enjoyable sessions of the three days, the optional evening discussion groups. Each evening those who wish to participate will be exposed to a special "event" such as the film "David and Lisa," an academy award winner and a classic study of beautiful communication between two emotionally disturbed children. Given the background of the day's session and the fascinating "mix" of people, these sessions are lively and dynamic.

Author of "Between Parent and Child" is guest communicator

Dr. Haim Ginott, best-selling author, will be guest communicator and resource person at the Snowmass Conference. Known through guest appearances on NBC's *Today* Show, and for his book "Between Parent and Child," he also wrote "Group Psychotherapy with Children," considered a classic in its field. Dr. Ginott is adjunct professor at New York University, Graduate Department of Psychology, and clinical professor at Adelphi University, postdoctoral program in psychotherapy. He is a member of the American Psychological Association, American Group Psychotherapy Association, and the American Academy of Psychotherapists.

"The first thing to remember is that children are not just 'kids,' they're little people."

Kids are miniature people. They have their own likes, dislikes, pleasures, pressures . . . and eventually they grow into full size people. That is why, during this three-day learning experience, children are treated as "people." Children from seven to eighteen will meet and work with smaller groups, based on their ages. Much of the same material used with parents will be employed. Teenagers are welcomed and encouraged to attend and participate in the optional evening discussions. The generation gap starts to close!

"People are the only creatures on earth who can talk themselves into trouble."

Communication is "The beginning of understanding." And with understanding comes personal and professional growth. This is a unique and unusual educational experience in that its prime objective is to help make you a more effective member of your profession through personal growth. We promise it will be the best thing to happen to your summer.

"Words don't have meaning, only people have meaning."

Come early, stay late. Snowmass-at-Aspen, with all its magnificent Rocky Mountain scenery, and vast recreational facilities, is the perfect spot for a family vacation. Extend your stay to a week or two and really get to know the land, the people, and the activities that make this one of the finest vacation communities in America. Special lodge and condominium rates are offered to those guests who wish to extend their stay to a week or more.

COST: Because this is a family-oriented, educational experience, the per person cost is far below that of regular seminars. Costs for the course itself are:

Physician	$175
Wife	30
Each child	15

"Communication, the cause of it all."

Each day is devoted to formal sessions in the morning, afternoon free time, and an optional evening discussion program.

There are separate sessions each of the first two mornings for you, for your wife, and for your children (over 6). The third morning, families come together.

Everybody rides the chairlift to the top of the mountain for a family breakfast at spectacular Sam's Knob Restaurant. Then family members participate in communication exercises as a family unit.

The course material covered during the ladies' session is exactly the same as that of the men's. By splitting into two groups, husbands and wives are given the opportunity to meet new people and gain new experiences independently, then share their new experiences and new friends during the afternoon free time periods. And in so doing, the fun and excitement of the communication process begins.

Share your afternoons on the golf course with new friends, enjoy a nature hike in the mountains with your family, or perhaps pack a couple of families into jeeps and head for a picnic and some of the magnificent scenery of the high country. It's all part of the total learning climate created at Snowmass-at-Aspen.

For more information, including complete particulars on the course, Snowmass activities, and economical lodge and condominium rates, fill out and return the coupon below. A complete packet of registration information will be on its way within 24 hours. Act now; all registrations must be in no later than July 1, 1970.

Tax deduction of expenses.

An income tax deduction is allowed for expenses of education (including travel, meals and lodging) undertaken to maintain and improve professional skills. The small extra costs incurred for family tuition, lodging, meals would not qualify.

MAIL TO:
SNOWMASS
c/o **Colorado Medical Society**
1809 E. 18th Ave.
Denver, Colo. 80218

Most of all, it's fun!

Please send the complete information packet on Snowmass, and Colorado Medical Society's Snowmass Communications Conference. August 3, 4, 5.

NAME _____

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15th Annual Colorado State Science Fair

The 15th Annual Colorado State Science Fair was held April 10-11, 1970 under the administrative direction of the Colorado Medical Society at Boulder Laboratories and Baseline Junior High School in Boulder, Colorado. It was sponsored by the Colorado Dental Association, the Colorado Engineering Council, the Colorado Medical Society, the National Bureau of Standards, the Colorado-Wyoming Academy of Sciences, the Environmental Science Services Administration and the Colorado Division of the American Cancer Society.

Friday, April 10, the students set up their exhibits by 1 p.m. Judging was completed Friday afternoon and evening.

Saturday, April 11, the Fair opened to the public. This was the first year that the Science Fair has been held without the participation of Wyoming students. In spite of this, the total number of exhibits at the 1970 Fair was only 17 less than the number displayed with the combined Fair of last year. Quality of the exhibits seemed much improved over previous years.

At 11:30 a.m. on Saturday, the Awards Luncheon was held in the University Memorial Center. First place for the Junior High Division was awarded to Arvind Srivastava of Fort Collins for his exhibit "Structure of Polywater." Randy Glissman of Northglenn won first place in the Senior High Division for his project, "Magnetic Tape Memorization by Sequence Shifting." Jeannie Corbridge placed second with her exhibit, "Pill Bugs: Capable Crustaceans." Both of these winners displayed their exhibits at the International Science Fair in Baltimore in May, expenses paid by the Colorado State Science Fair.

Karen Enns, an 11th grade student from Rocky Ford, won the Colorado Medical Society award for her project "Cultivation of Oryctolagus Cuniculus Kidney Cells by the Monolayer Technique." Karen will be a guest at the Annual Session of the Colorado Medical Society at the Broadmoor in September and will have her exhibit on display.

Other special awards were made by:

Amelia Earhart Award, Zonta Club of Boulder County

American Astronautical Society

American Cancer Society, Colorado Division

American Institute of Mining Engineers

American Society for Microbiology

Colorado Dental Association

Colorado Mineral Society

Colorado Psychological Association

Colorado Science Teachers Association

Colorado State Society of Medical Technologists

Marine Technology Society

National Aeronautics and Space Administration

National Association of Corrosion Engineers

Research Society of America, Boulder Branch

Society for Industrial and Applied Mathematics

Society of Photographic Scientists & Engineers

Society of Women Engineers, Denver Section

United States Air Force

United States Navy Science Cruiser

Sigma Xi

Jeannie Corbridge won third place in the zoology division at the International Science Fair held in Baltimore, Maryland, May 10-15. She also received the American Psychological Certificate of Merit and second prize of the Psychology Association, Division on Teaching of psychology.

Randy Glissman received first place award of the American Patent Law Association.

MEETINGS

Colorado Medical Society
1970 Annual Meeting
Broadmoor Hotel
Colorado Springs, Colorado
September 23-26, 1970

Write: Colorado Medical Society, 1809 East 18th Ave., Denver, Colorado 80218 or call 399-1222.

Intensive Coronary Care Symposia
St. Patrick Hospital and the
University of Montana
Missoula, Montana
September 13-17, 1970
March 21-25, 1971

Registration is limited to 22 physicians. First choice will be given to physicians who are staff members of hospitals participating in the Coronary Care Training Program, an activity of the Mountain States RMP. AAGP Credit: 33 hours. Write WICHE, Mountain States RMP; Coronary Care Training Program, 500 West Building, Missoula, Montana 59801.

Montana Medical Association
1970 Annual Meeting
Student Union Building
Montana State University
Bozeman, Montana
September 16-19, 1970

Write: Montana Medical Association, P.O. Box 1692, Billings, Montana 59103 or call 406—259-2585.

Nevada State Medical Society
1970 Annual Meeting
Sahara Tahoe Hotel
Lake Tahoe, Nevada
September 1-4, 1970

Write Nevada State Medical Association, 3660 Baker Lane, Reno, Nevada 89502 or call 702—323-5181.

Wyoming State Medical Society
Jackson Lake Lodge
Moran, Wyoming
September 1-4, 1970

Write: Wyoming State Medical Society, P.O. Box 1387, Cheyenne, Wyoming 82001 or call 307—634-7305.

(Correction Notice)
Utah State Medical Association
1970 Annual Meeting
Salt Palace
Salt Lake City, Utah
September 8-11, 1970

Write: Utah State Medical Association, 42 South 5th East St., Salt Lake City, Utah 84102 or call 801—355-7477.

MEDICAL SCHOOL NOTES

University of Colorado Medical Center

A $6,500 gift in memory of a New York friend of children is helping medical scientists at the University of Colorado Medical Center shorten from six months to 15 minutes the time required to accomplish complex tests for the detection of inborn chemical disorders of childhood. The gift memorializes the late Joseph F. Murray of Manhasset, Long Island, a member of the board of directors of the Children's Metabolic Research Foundation, which has its national headquarters in Denver.

The memorial gift was presented to the Stolinsky Laboratories by the Children's Metabolic Research Foundation as a further contribution toward equipping the computerized mass spectrometry laboratory in the John F. Kennedy Child Development Center on the CU medical campus. The Stolinsky Laboratories are the research and clinical facility for the Kennedy Center.

* * * * *

A custom-built linear scanner which traces radioactive isotopes in the blood stream is helping medical researchers at the University of Colorado Medical Center learn why cancer tumors seem to trap two of the blood's most prominent protein substances.

The scanner, one of few of its kind in the world and the only one of its exact description, was built by space scientists at the Laboratory for Atmospheric and Space Physics (LASP) on CU's Boulder campus to meet specific requirements of the Division of Laboratory Medicine at the Medical Center in Denver.

The scanner is being used to measure the metabolism of blood proteins in an effort to learn if and why a tumor concentrates proteins, especially fibrinogen. The scanner indicates the breakdown rate of radioactively labeled proteins and pinpoints concentrations of proteins in the body.

* * * * *

Dr. David W. Talmage, dean of the University of Colorado School of Medicine, announced the establishment of an independent Department of Anesthesiology in the school effective July 1.

Anesthesiology has been a division of the Department of Surgery in the medical school since 1949, an administrative structure common in American medical schools for many years. Current practice is to give full recognition to the discipline of anesthesiology by the creation of independent departments, recognizing the relationships not only with surgery, but also with obstetrics and gynecology, pediatrics and internal medicine.

* * * * *

The Regents of the University of Colorado approved a gift-purchase agreement under which Mrs. Walter P. Paepcke will make land available for construction of the Given Institute of Pathobiology in Aspen. The agreement provides that Mrs. Paepcke will sell to the University for $70,000 a plot of land with a valuation of $125,000. The site is adjacent to the Paepcke home in Aspen and overlooks Hallam Lake. Mrs. Paepcke, with her late husband, has been sponsor and patron of the Aspen renaissance over the past two decades.

The Given Institute is being established under auspices of the CU School of Medicine in Denver through a gift of $500,000 from the Irene Heinz Given and John Laport Given Foundation of New York City. The institute will be designed to provide "a continuing year-round education center for the holding of conferences, seminars and symposia for scientific groups interested in biomedical communications and the integration of knowledge among disciplines" as stipulated in an action by the Board of Regents last May.

University of Utah Medical Center

The Intermountain Regional Medical Program and the University of Utah Medical Center recently opened the newly completed Regional Cerebrovascular Disease Unit (CVU) in the Medical Center. One of the very few units in the United States specifically designed to treat stroke patients, the Cerebrovascular Disease Unit provides a new concept of care. Emphasis is on diagnosing and treating the previously unrecognized subtle changes in the patient's condition which lead to a massive stroke.

The Regional CVU will serve the practicing physicians in a six-state region including Utah and parts of Nevada, Idaho, Montana, Colorado and Wyoming. The unit has been developed through the Intermountain Regional Medical Program, one of 54 programs in the country providing the latest information on patient care in heart, cancer and stroke for physicians and other medical personnel.

* * * * *

A contract for a broad new teaching and research program in mental retardation has been signed between the University of Utah College of Medicine at Salt Lake City, and the Utah State Training School at American Fork.

The contract allows for the expansion of training school, clinical and research facilities for neurological diagnosis and treatment of mentally retarded patients under the auspices of the Departments of Neurology and Pediatrics, and the Division of Pediatric Neurology at the University of Utah College of Medicine. Methods for improving the recognition, treatment, and possible prevention of mental retardation will be studied through a new scientific research program provided for in the contract. The agreement also established a genetic counseling service for families with mentally retarded children.

Jack A. Madsen, MD., clinical research neurologist at the College of Medicine, will be the director of the program.

The contract period is from April 1, 1970, to June 30, 1971, and will be renewed on an annual basis by mutual agreement of both institutions.

* * * * *

Opening ceremonies for the University of Utah Medical Center's new heliport were held this spring. The large red cross-marked circular landing area, located across the street from the Emergency Room Entrance, is capable of handling the largest types of helicopters, and offers virtually unobstructed approach from all directions, day and night.

University of New Mexico School of Medicine

In the next five years, New Mexico will become a mecca for cancer patients from throughout the world—placing a heavy responsibility on New Mexico physicians and on the University of New Mexico School of Medicine.

The new meson facility now under construction at Los Alamos will provide a new, intense form of cancer treatment which is not available anywhere else in the world.

The $56-million meson facility includes a half-mile long channel which houses the linear accelerator, which can accelerate the force from zero to 87 per cent the speed of light. The force of the beam can be tailored to exactly the size and shape of the tumor, and can be precisely pinpointed to destroy only the tumor mass without damaging healthy tissue.

This will be the only facility in the world which can provide such beams. Location of the facility 50 miles from Albuquerque is a "golden opportunity" to make a significant difference in the life of the state.

The accelerator also will make radioactive isotopes which will be the most proton-rich in the world. Used in many types of research, these now must be flown into New Mexico from other sources, have a very short life, and are extremely expensive.

OBITUARIES

Colorado

When **Herman William Roth, MD, of** Monte Vista died on April 25, 1970, the Colorado Medical Society and particularly the San Luis Valley lost a loved and skillful physician. The entire profession lost a truly great philosopher and judge.

From 1950 through 1967 Herman Roth had served on this Society's supreme Judicial Council, the last twelve of those years as its Chairman. He declined urgent requests to accept another three-year term only because of his own and his family's health problems. He loved the study of medical ethics and the work of his Council, despite the heartaches that come to any person who must sit in judgment of the activities of his peers.

He had chaired the Judicial Council's lengthiest and perhaps its most difficult hearing on the occasion when almost an entire county medical society was on trial. He chaired even more tense Council sessions from the late 1950s through 1961 which resulted in the three history-making decisions on "Free Choice of Physician" and the equally important opinion on Relationships between Doctors of Medicine and Doctors of Osteopathy. All of these were nationally acclaimed.

Herman Roth was born in Farmington, Iowa, Oct. 31, 1902. His 1932 BS degree and his 1934 MD were from the University of Oklahoma, after which he interned at Denver's Mercy Hospital. Then he practiced a year or so in a New Mexico logging camp before settling permanently in Monte Vista. He served throughout World War II in the Army, saw service in the South Pacific and later service back in the States as a Major, teaching tropical disease control to other officers about to go overseas. He returned to Monte Vista in 1948 and practiced there until his death.

He was Chief of Staff of the Monte Vista Community Hospital and had been a charter member of the Colorado Chapter of the American Academy of General Practice. He is survived by his widow, Creseda, one daughter, Mrs. Dee Martin of Alamosa, several grandchildren and even great grandchildren.

James Earl Russell, Jr., MD, a former prominent Denver pediatrician, died following a long illness at his home in Laguna Hills, California, Sunday evening, April 26.

He was born on July 22, 1896, in Boulder, Colorado. He received his pre-medical education at McGill University in Montreal, Canada, and at Columbia University in New York City. Later he studied medicine at Columbia University Medical Center in New York City for three years, and following this, finished his medical course at Iowa University, where he was awarded an MD Degree in 1920. He also received a Master of Science degree from Iowa University in 1922.

Following an internship at the University of Iowa Medical Center in Iowa City, Doctor Russell began the study of his specialty of pediatrics at the University of Iowa, and received further training in his specialty in Vienna, Zurich, Paris, the University of Edinburgh, Children's Hospital in Glasgow, Scotland, and the Children's Hospital in London.

While in Denver Doctor Russell was a member of the American Academy of Pediatrics, the Rocky Mountain Pediatric Society, American College of Allergy, and the Southwestern Allergy Forum. He was a certified member of the American Board of Pediatrics. He also served one term as president of the medical staff of Children's Hospital in Denver.

Doctor Russell was a medical student during World War I and for this reason served only in the United States Reserve Corps. He was married to Olive Kennedy in Scranton, Pennsylvania, soon after finishing his residency in pediatrics. Besides his widow, he is survived by a brother, John M. Russell of New York City; three daughters, Mrs. William R. Stewart of Santa Barbara, California; Mrs. James S. Seewald, Broomfield, Colorado, and Mrs. Richard Makela of Little Rock, Arkansas; one son, James E. III, San Mateo, California; and ten grandchildren.

William Dickson Millett, MD, Chief of Pathology at St. Luke's Hospital, Denver, died April 17, 1970 at the age of 49.

Born May 5, 1920 in Denver, he attended St. Mark's Preparatory School of Southboro, Mass. and Yale University. He then returned to Denver to attend the University of Colorado School of Medicine from which he received an MD in 1945 and an MS degree in Pathology in 1950.

Doctor Millett interned at Hartford Municipal Hospital in Connecticut from 1945-46 after which he served as a Captain in the Medical Corps of the United States Air Force. Upon completion of duty, he returned to Denver and served a residency in pathology at the University of Colorado Medical Center from 1948-50. He also served residencies at Children's Hospital in Denver in 1951 and at Memorial Hospital in New York City in 1951-52.

Doctor Millett devoted considerable time and energy to the founding of Spalding House, now Spalding Rehabilitation Center, a long-term treatment and nursing facility in Denver. He was a member of the Board and former chairman of the Board of Directors of the Center.

At the time of his death he was assistant professor of pathology at the University of Colorado School of Medicine and associate professor of pathology at Colorado State University in Fort Collins.

He was a member of the American Medical Association, the Congress of American Pathologists and the Colorado Medical Society.

Doctor Millett is survived by his widow, Alice; a son, William J. Millett; three daughters, Katherine, Elizabeth and Margaret; his mother, Mrs. Daniel A. Millett; two sisters, Mrs. Laurence Goodyear of Buffalo, New York and Mrs. Karl Arndt of Denver; also one brother, Daniel of Lawrence, New York.

Borah Mozer, MD, of Denver died May 1, 1970 at the age of 65.

Born in Russia June 17, 1905, Doctor Mozer attended Denver University from which he received his BA and MA degrees. He subsequently attended the University of Colorado School of Medicine receiving his MD in Psychiatry in 1939.

Doctor Mozer interned at St. Anthony's Hospital from 1939-40 and served a residency at the University of Colorado School of Medicine from 1953-57.

He was a member of the American Medical Association, the Colorado Medical Society and the Denver Medical Society.

Besides his widow, Sarah, he is survived by two daughters, Mrs. Gerald Kauver of Chicago and Evelyn Rotner of Boulder; a son, Erwin Mozer of Louisville, Kentucky; and a sister, Mrs. Michael Bograd.

Leo Leslie Lux, MD, born May 16, 1889 in Union City, Michigan, died at Greeley in March of 1970 at the age of 81.

Doctor Lux attended the American School of Osteopathy in Kirksville, Missouri from which he received his D.O. degree in 1915. Later, he attended the Kansas City University of Physicians and Surgeons, in Kansas City, Missouri, receiving his M.D. in 1923.

Doctor Lux was a member of the American Medical Association, the Colorado Medical Society, and the Weld County Medical Society.

Montana

Bernard John Heetderks, Sr., MD, died at his home in Bozeman on October 22, 1969. Doctor Heetderks was born on November 25, 1892, in Grand Rapids, Michigan. He received his MD degree from the Chicago College of Medicine and Surgery in 1916, after completing a two year internship in Detroit, Michigan. Doctor Heetderks practiced in Missoula, Montana, for two years before he enlisted in the medical corps of the United States Army. Upon his discharge in 1919, he engaged in the general practice of medicine in Manhattan. In the fall of 1929, he moved to Bozeman and continued the general practice of medicine until the summer of 1969.

Laurence Louis Maillet, MD, Great Falls, died suddenly at his home on March 27, 1970. Doctor Maillet was born in Butte, Montana, February 17, 1910. He received his BS degree from Creighton University in 1931 and his MD degree from Creighton University School of Medicine in 1934. Upon completion of his internship at a hospital in Omaha, Nebraska, he moved to Three Forks, Montana, where he was engaged in the general practice of medicine until he moved to Great Falls in 1945. Doctor Maillet was a past president of the Cascade County Medical Society.

Neil John O'Keefe, MD, died on April 3, 1970, in Butte. Doctor O'Keefe was born in Butte, Montana, on August 15, 1900. He received his BS degree from Georgetown University in 1924 and his MD degree from Georgetown University School of Medicine in 1926. Immediately after graduation he served his internship at St. James Hospital in Butte. He continued his active practice in his home community until a few months prior to his death.

THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Current Diagnosis and Treatment: By Henry Brainerd and others. Los Altos, California, 1970, Lange Medical Publications. 884 p. Price: $11.00.

Disease of Bone and Joints: By Louis Lichenstein. St. Louis, 1970, Mosby. 228 p. Price: $17.50.

Dynamics of Work and Marriage (Scientific Proceedings of Amer. Acad. of Psychoanalysis, v. 16): Edited by Jules Masserman. New York, 1970, Grune and Stratton. 144 p.

Early Diabetes—Supplement to Advances in Metabolic Disorders: Edited by Rafael Camerini-Davalos. New York, 1970, Academic Press. 486 p. Price: $16.50.

Evil In Man: By Gustav Bychowski. New York, 1968, Grune and Stratton. 98 p. Price: $4.75.

Handbook of Psychiatry: By Philip Solomon and Vernon D. Patch. Los Altos, California, 1969, Lange Medical Publications. 623 p. Price: $7.00.

How From A Monkey I Became A Man: By Sam Goldfarb. Hallandale, Florida, 1967, Operation Truth, Inc. 191 p. Price: .95.

Mental Health Directory: By National Clearinghouse for Mental Health Information, 1970, National Institute of Mental Health. 445 p. Price: $4.00.

Progress In Clinical Pathology, v. 3: Edited by Mario Stefanini. New York, 1970, Grune and Stratton. 426 p. Price: $19.50.

The Response To Meprobamate—A Predictive Analysis: By J. R. Wittenborn, Ph. D. New York, 1970, Raven Press, 113 p. Price: Gift.

Stomach Surgery: By Jacob A. Glassman. Springfield, Ill., 1970, Thomas. 379 p. Price: $18.50.

Urology: Edited by Meredith F. Campbell and J. Hartwell Harrison. 3rd ed. Philadelphia, 1970, Saunders. 3 vols. Price: $110.00.

Book Reviews

Medicine and Stamps; American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610; $4.00 (payment must accompany order, quantity discounts available); 216 pages; R. A. Kyle, M. D. and M. A. Shampo, Ph.D.

Medicine and Stamps is an amazing book. If you have any interest in medicine, or any fascination with stamps you won't be able to put it down.

From the very first page where it discusses Angel Arturo Aballi, Cuban fighter for the rights of children and medicine against hostile political regimes, to the very last, where it tells of Lazarus Ludwig Zamenhof, Russian ophthalmologist and developer of Esperanto, the universal language, the pace never slows.

In between A and Z over 150 medical greats of yesteryear pass in review, immortalized on stamps from 53 different countries: Hippocrates, the Greek "father of medicine" (Yemen Arab Republic); Louis Pasteur, developer of pasteurization (Poland); Florence Nightingale, who made nursing a reputable profession (Dominica); and the Drs. Mayo, founders of the famous Mayo Clinic (U.S.), to name a few. Each stamp is followed by a short biographical vignette of the pictured physician.

But there is more to be learned here than just medical history—if you ever collected stamps as a child this book will stir your banked philatelic fires into new life. Many of the stamps are shown in color and all are identified by number from Scott's Standard Postage Stamp Catalogue, which gives information on colors, watermarks, papers and perforations.

The idea for the book developed when the late John A. Mirt staged a postage stamp exhibit at a meeting of the American Medical Association in Miami in 1960. It was entitled, "Medical Pathfinders on Stamps". Interest grew until more than 200 biographical vignettes appeared in the Journal of the American Medical Association over a period of nine years, illustrated by photographs of stamps. Publication of this collection in book form was the next logical step. It was edited by two physician-philatelists of the Mayo Clinic, Rochester, Minn.

Disadvantaged Children: Health, Nutrition and School Failure; by Herbert G. Birch, MD, PhD, and Joan Dye Gussow (Harcourt & Brace & World and Grune & Stratton).

We have written *Disadvantaged Children: Health, Nutrition, and School Failure* to call attention to the health problems which underlie the school failure of impoverished children. "What do you hope for," someone asked us, "if you write such a book?" What we hope for is an awareness of the size and scope of the danger confronting children born *of* and *into* poverty. What we hope for is a changed system of providing for those who cannot presently provide for themselves. What we hope for is a program that will break the continuous intergenerational chain of poverty. What we hope for is a change in the national penchant for, in the words of Senator Mondale, "authorizing dreams and appropriating peanuts." What we hope for is a change from the wistful notion that expressions of goodwill and a national verbal commitment are sufficient to reduce the spreading problems which are festering along our back country roads, swelling up in our cities, and spreading into our suburbs, problems created by the existence of an impoverished minority—of all colors—which is excluded by ill health and poor education from full participation in American life.

—Herbert G. Birch, M.D., Ph.D
Joan Dye Gussow

Insurance Coverage for Mental Illness, a book detailing the latest developments in this field, has been published by the American Management Association. The book, written by J. F. Follmann, Jr., director of information and research of the Health Insurance Association of America, contains chapters devoted to treatment facilities and services, financing psychiatric care, and the dimensions of the mental illness problem.

The 135-page work also details health insurers' experiences with psychiatric treatment and includes a chapter on "Insurance Coverage: An Overview," and another on "Extent of Insurance Coverage and Other Types of Protection."

Mr. Follmann, an author and lecturer, has served as an adviser to the American Psychiatric Association and as a consultant to the Department of Health, Education and Welfare Task Force on Alcoholism. He is also a consultant to the American Medical Association and American Dental Association. The book, which uses government, insurance company and other private health insurance data, is available from the American Management Association at $5 a copy.

It is being distributed without charge to AMA members enrolled in the Insurance Division.

THE NATIONAL FOUNDATION-MARCH OF DIMES
Announces Publication of
THE CLINICAL DELINEATION OF BIRTH DEFECTS
For the First Time — An In-depth Reference in This Field,
Assembled in Five Volumes
A total of more than 1200 large-format pages . . . including more than 2200 illustrations . . . 140 tables . . . complete references . . . and more than 140 case histories

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BUSY DERMATOLOGICAL PRACTICE AVAILABLE immediately, due to death. Located in Northern Rocky Mountains. Phone 406—656-3850, or write Box 470-3-3, Rocky Mountain Medical Journal, 1809 East Eighteenth Avenue, Denver, Colorado 80218. 470-3-3

GENERAL PRACTICE AVAILABLE NOW. 1100 sq. ft. office space, air-conditioned and fully carpeted. Excellent location near new industrial site in Broomfield's Garden Center, Medical Arts Building. Contact Dr. Samuel Novak, Garden Office Center, Broomfield, Colorado. Phone 466-7306. 670-2-1B

DOCTOR IN GENERAL PRACTICE wanted for 2-3 hours a day at Union Pacific Dispensary, 5 days a week. Contact Athley Haley, M.D., 1620 Gaylord Street, Denver, Colorado 80206, Tel. 333-5492. 570-5-3

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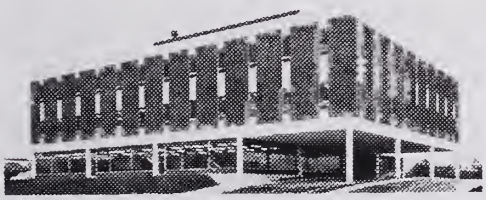

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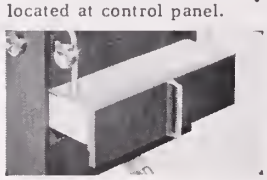

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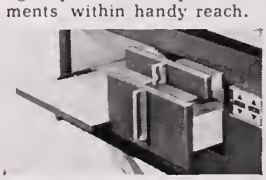

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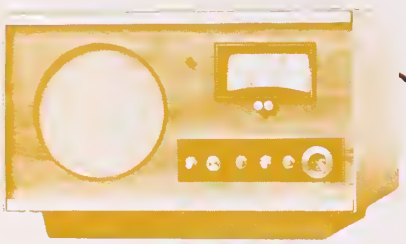

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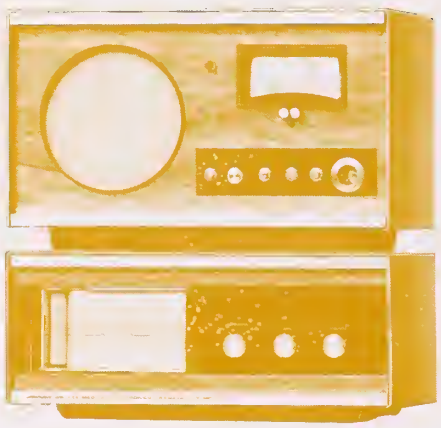

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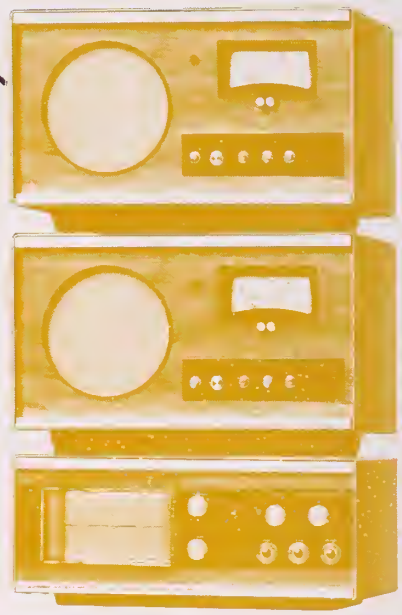

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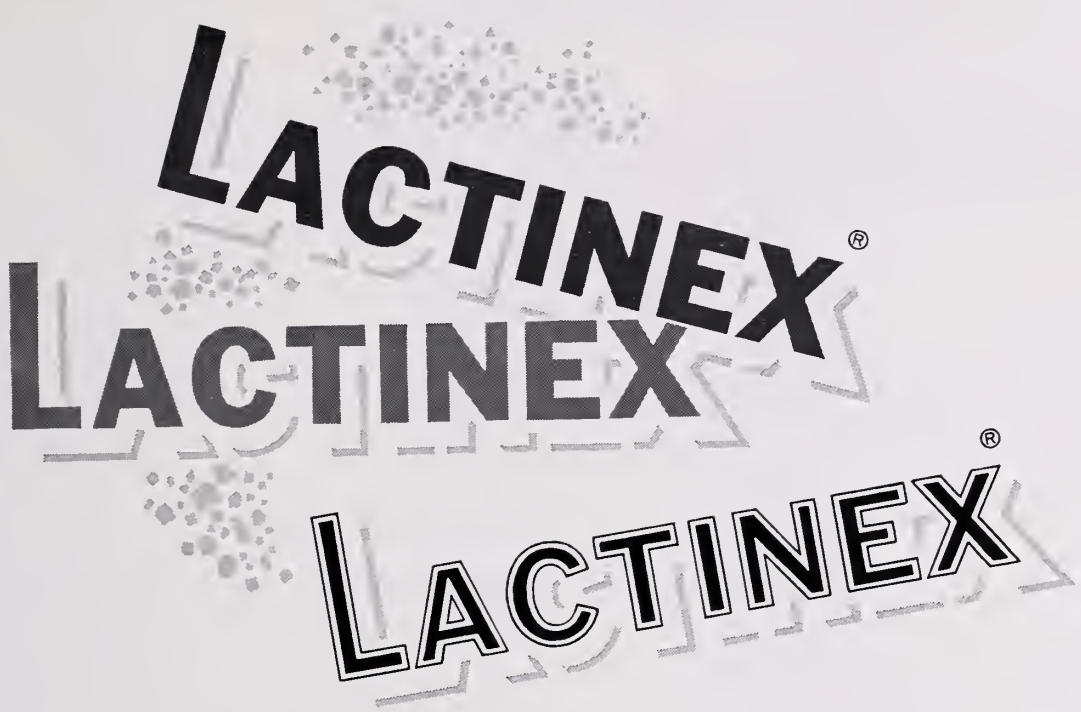

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OUR COVER PHOTO

Wyoming's Grand Teton makes a majestic backdrop for calm Hedrick Pond. Stretching 7,000 feet above the valley known as Jackson Hole, the Tetons, which tower over pine-covered mountains and valleys for 40 miles, are the major attraction in Grand Teton National Park.
Photo Courtesy of the Wyoming Travel Commission.

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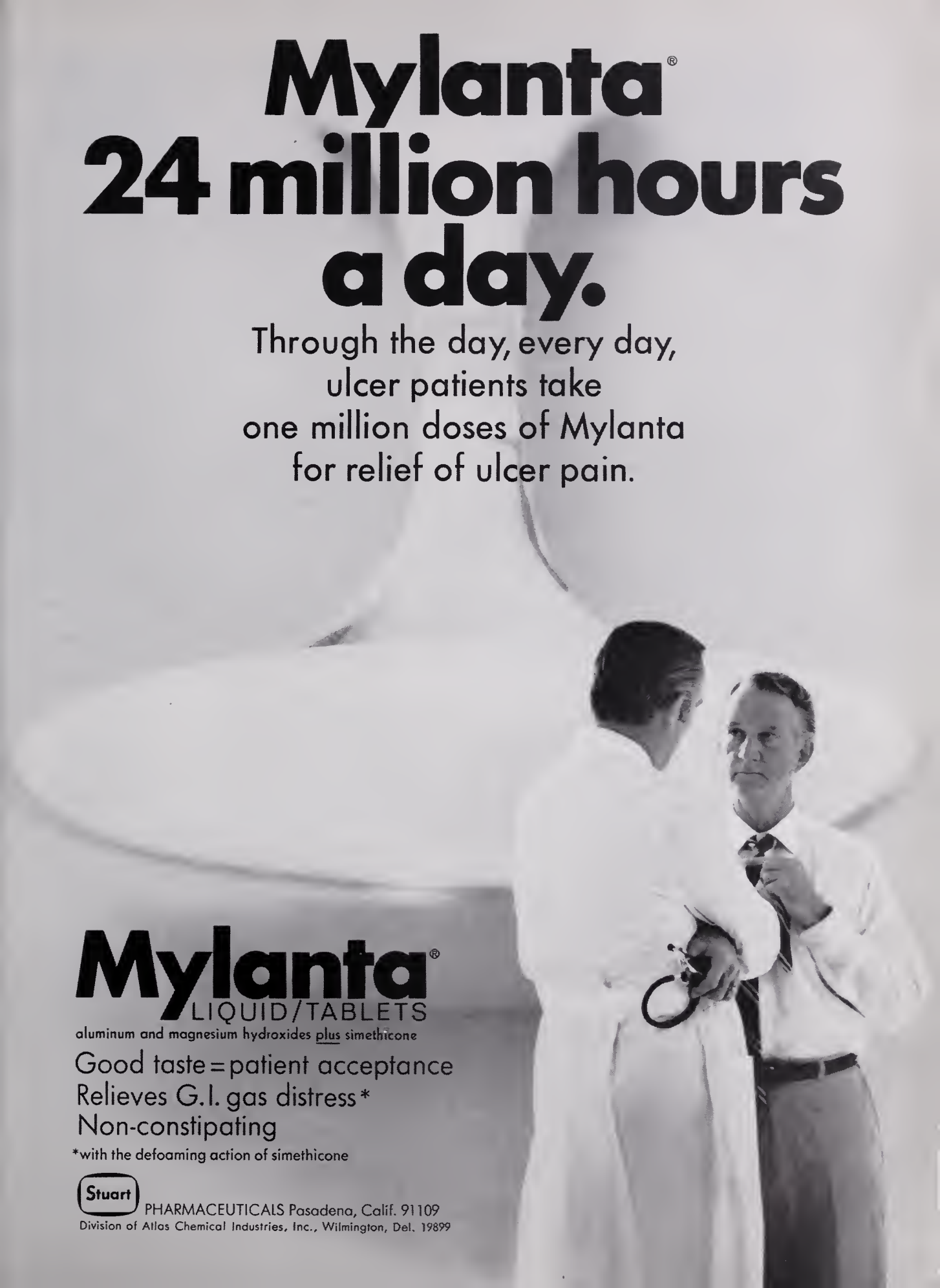

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To the Editor:

Mr. Kenneth A. Stonex, currently Executive Engineer, Automotive Safety Engineering, and formerly Assistant Director of Proving Grounds, General Motors, has written: "I propose that our highway system design and operating practice is precisely that which we would have built if our objective had been to kill as many people as possible."

All motorcar durability testing on the GM Proving Grounds is done on two-lane one-direction roads so that cars going in opposite directions never have opportunity for contact. There are no head-on collisions on the General Motors Proving Ground. As can be imagined, the drivers employed in the durability testing program are carefully selected and thoroughly indoctrinated. Nevertheless, about 30 times a year these test drivers go off the side of the road, for various reasons, the principal reason being, as Mr. Stonex has said, because they are human. "Proving Ground drivers leave the road once every 240,000 miles because of human failure, and those of us in the public highway traffic stream must fail more frequently."

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Perhaps the greatest collection of facts, figures and photographs concerning the roadside hazards on this nation's roads is the report of the Hearings before the House Special Subcommittee on the Federal-Aid Highway Program, May-July, 1967, entitled HIGHWAY SAFETY, DESIGN and OPERATIONS: Roadside Hazards (90-21). This 1243-page volume may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402 for $3.50. The Denver Public Library is a Federal Deposit Library, and this volume can be obtained there.

Horace E. Campbell, M.D

Interstate systems and highways are dangerously engineered. Automobiles are unsafe at any speed. Traffic cops are never around to nail that idiot who passed you at breakneck speed. If you have an accident, it's not your fault. Right?

Wrong.

Statistics collected and published in a booklet by The Travelers Insurance Companies keep drivers on the hook. Their compilation of accident facts makes it clear that 1969's record-breaking toll of 56,500 killed and 4,700,000 injured is attributable to driver error. If you are eager to find a scapegoat, don't read it.

Insurance companies have been berating drivers for a long time. Their essential motive is profit: if the accident rate is cut, claims will be cut and so will the cost of their product.

In their booklet, Travelers takes a poke at highway engineers and auto manufacturers, but they conclude from all the appalling statistics that drivers are the ultimate culprits.

MEETINGS

32nd Midsummer Radiological Conference
Rocky Mountain Radiological Society
Brown Palace Hotel—Denver, Colorado

August 20-22, 1970

Thursday, August 20

Air Encephalography—Part I—Normal and Abnormal
Refresher Course Sponsored by the Radiological Society of North America
Henry W. Pribram, M.D., Long Beach, California

Newer Techniques in Examination of the Chest
Richard H. Greenspan, M.D., San Francisco, California

Primary Benign Lesions of Bone
Elias G. Theros, M.D., Washington, D.C.

Luncheon—Onyx Room—Mezzanine
Robert W. McConnell, M.D., Dallas, Texas—Speaker

Radiotherapy of Tumors of Oral Cavity
Joseph R. Castro, M.D., Houston, Texas

Radiologic Assessment of Regional Pulmonary Function
E. James Potchen, M.D., St. Louis, Missouri

Roentgen Diagnostic Panel
Marvin L. Daves, M.D., Moderator;
Participants: *Drs. Richard H. Greenspan, Henry W. Pribram, Elias G. Theros*

Friday, August 21

Radiotherapy of Tumors of the Oropharynx
Joseph R. Castro, M.D., Houston, Texas

Primary Malignant Lesions of Bone
Elias G. Theros, M.D., Washington, D.C.

Pulmonary Embolism—Pathophysiology, Diagnosis, and Management
Richard H. Greenspan, M.D., San Francisco, California and *E. James Potchen, M.D.*, St. Louis Missouri

Luncheon—Onyx Room— Mezzanine
Presiding—*C. N. Sorensen, M.D.*, Scottsbluff, Nebraska
Informal meeting with guest speakers.
Question period.

Air Encephalography—Part II—Normal and Abnormal
Refresher Course Sponsored by the Radiological Society of North America
Henry W. Pribram, M.D., Long Beach, California

Amyloidosis
Bertram L. Pear, M.D., Denver, Colorado

Arteriography in Abdominal Trauma
Charles E. Seibert, M.D., Denver, Colorado

Newer Concepts in Neuro-nuclear Medicine
E. James Potchen, M.D., St. Louis, Missouri

Splenic Vein Thrombosis: A Consideration in Upper Gastrointestinal Bleeding
Andrew B. Crummy, Jr., M.D., Madison, Wisconsin

Mediocolegal Aspects of the Expanding Role of Technologists
Maurice E. O'Connor, M.D., Denver, Colorado

Saturday, August 22

Some Exercises in the Differential Diagnosis of Bone Lesions
Elias G. Theros, M.D., Washington, D.C.

Radiotherapy in Tumors of Endolarynx
Joseph R. Castro, M.D., Houston, Texas

Benign Pulmonary Diseases
Richard H. Greenspan, M.D., San Francisco, California

Air Encephalography—Part III—Normal and Abnormal
Refresher Course Sponsored by the Radiological Society of North America
Henry W. Pribram, M.D., Long Beach, California

Luncheon—Onyx Room—Mezzanine
Annual Meeting — Rocky Mountain Chapter, American Society of Nuclear Medicine
Presiding—*Bertram L. Pear, M.D.*, Denver, President
Guest Speaker--*E. James Potchen, M.D.*, St. Louis, Missouri
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AGA Postgraduate Course
"Hepatitis"
Snowmass-at-Aspen, Colorado

August 20-22, 1970

The course will examine all aspects of viral hepatitis, including recent discoveries related to prevention. Tuition is $100.00 ($25.00 for house and staff students.)

For information write: American Gastroenterological Association, 740 Krameria Street, Denver, Colorado 80220.

Children's Hospital
Denver, Colorado

Vail Conference on Pediatric Practice (Vail, Colorado) (Sponsored by Denver Children's Hospital)
September 17-19, 1970

5th Annual Colorado-Nebraska Obstetric and Pediatric Conference (Children's Hospital, Denver)
October 30-31, 1970

The W. Wiley Jones Memorial Lecture (Children's Hospital, Denver)
November 13, 1970

Pediatric Neurology (Children's Hospital, Denver)
December 11, 1970

For further information contact: L. Joseph Butterfield, M.D., Director, Department of Continuing Education, Children's Hospital, 1056 East 19th Avenue, Denver, Colorado 80218.

The American College of Emergency Physicians
2nd Scientific Assembly
Las Vegas, Nevada
October 18-23, 1970

Focus will be on the delivery of primary care in the hospital emergency department. For more details write: Executive Secretary, 120 West Saginaw, East Lansing, Michigan 48823.

The Northwest Proctologic Society Meeting
Alderbrook Inn,
Union, Washington 98592
August 23-26, 1970

Write: F. Gary Lewis, M.D., 821 Boylston Avenue, Seattle, Washington 98104.

National Conference on Cancer of the Colon and Rectum
Hotel del Coronado
San Diego, California
January 7-9, 1971

For more information write: Roald N. Grant, M.D., Vice President for Professional Education, American Cancer Society, 219 East 42nd Street, N.Y., N.Y. 10017.

Biennial Western Conference on Anesthesiology
Princess Kaiulani Hotel
Honolulu, Hawaii
May 2-7, 1971

Write: Eldon E. Smith, M.D., 2270 Kalakaua Avenue, Suite 804, Honolulu, Hawaii 96815.

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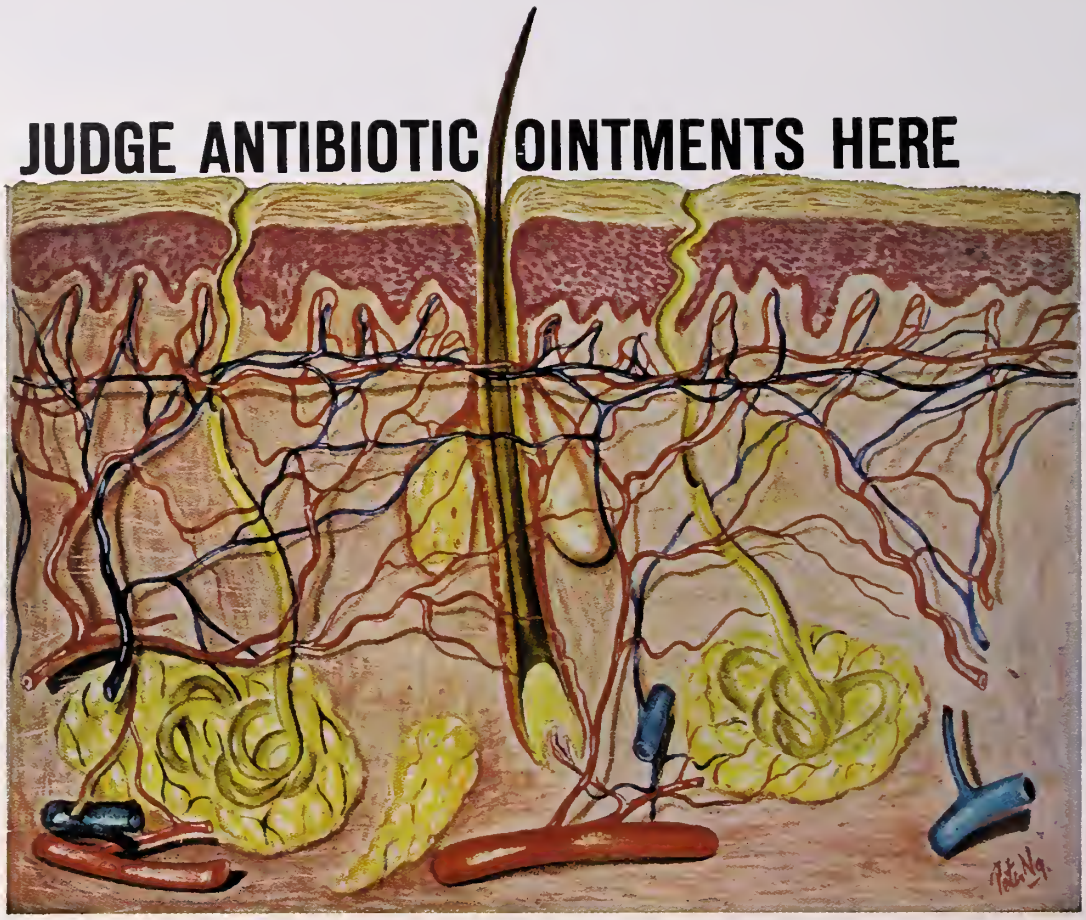

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Indications: For use in management of anxiety and tension occurring alone or as accompanying symptom complex to medical and surgical disorders and procedures. Though not a hypnotic, fosters normal sleep through antianxiety and related muscle-relaxant properties.

Contraindications: History of sensitivity to meprobamate.

Important Precautions: Carefully supervise dose and amounts prescribed, especially for patients prone to overdose themselves. Excessive prolonged use has been reported to result in dependence or habituation in susceptible persons, as alcoholics, ex-addicts, and other severe psychoneurotics. After prolonged excessive dosage, reduce dosage gradually to avoid possibly severe withdrawal reactions. Abrupt discontinuance of excessive doses has sometimes resulted in epileptiform seizures.

Warn patients of possible reduced alcohol tolerance, with resultant slowing of reaction time and impairment of judgment and coordination.

Reduce dose if drowsiness, ataxia or visual disturbance occurs; if persistent, patients should not operate vehicles or dangerous machinery.

Side Effects: include drowsiness, usually transient; if persistent and associated with ataxia, usually responds to dose reduction; occasionally concomitant CNS stimulants (amphetamine, mephentermine sulfate) are desirable. Allergic or idiosyncratic reactions are rare, but such reactions, sometimes severe, can develop in patients receiving only 1 to 4 doses who have had no previous contact with meprobamate. Previous history of allergy may or may not be related to incidence of reactions. Mild reactions are characterized by itchy urticarial or erythematous maculopapular rash, generalized or confined to groin. Acute nonthrombocytopenic purpura with cutaneous petechiae, ecchymoses, peripheral edema and fever have been reported. One fatal case of bullous dermatitis following intermittent use of meprobamate with prednisolone has been reported. If allergic reaction occurs, meprobamate should be stopped and not reinstituted. Severe reactions, observed very rarely, include angioneurotic edema, bronchial spasms, fever, fainting spells, hypotensive crises (1 fatal case), anaphylaxis, stomatitis and proctitis (1 case) and hyperthermia. Treat symptomatically as with epinephrine, antihistamine and possibly hydrocortisone. Aplastic anemia (1 fatal case), thrombocytopenic purpura, agranulocytosis and hemolytic anemia have occurred rarely, almost always in presence of known toxic agents. A few cases of leukopenia, usually transient, have been reported on continuous administration.

Meprobamate may sometimes precipitate grand mal attacks in patients susceptible to both grand and petit mal. Extremely large doses can produce rhythmic fast activity in the cortical pattern. Impairment of accommodation and visual acuity has been reported rarely. After excessive dosage for weeks or months, withdraw gradually (1 or 2 weeks) to avoid recurrence of pretreatment symptoms (insomnia, severe anxiety, anorexia). Abrupt discontinuance of excessive doses has sometimes resulted in vomiting, ataxia, tremors, muscle twitching and epileptiform seizures. Prescribe very cautiously and in small amounts for patients with suicidal tendencies. Suicidal attempts have resulted in coma, shock, vasomotor and respiratory collapse and anuria. Excessive doses have resulted in prompt sleep; reduction of blood pressure, pulse and respiratory rates to basal levels; and occasionally hyperventilation. Treat with immediate gastric lavage and appropriate symptomatic therapy. (CNS stimulants and pressor amines as indicated). Doses above 2400 mg./day are not recommended.

Composition: Tablets, 200 mg. and 400 mg. meprobamate. Coated Tablets, WYSEALS* EQUANIL (meprobamate) 400 mg. (All tablets also available in REDIPAK* [strip pack]. Wyeth.) Continuous-Release Capsules, EQUANIL L-A (meprobamate) 400 mg.

The young homemaker: her underlying anxiety and tension can surface and intensify under the continuous stress of rearing a growing family. Especially when she's confined to the home and its environs so much.

You can help her over the rough spots with reassurance and counsel. Equanil can help relieve tension, ease anxiety—with little risk of serious side effects. Time and experience will probably do the rest.

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(meprobamate)

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PRECAUTIONS: As with other thyroid preparations, overdose moy couse diarrhea or cromps, nervousness, tremors, tachycordio, insomnio ond continued weight loss. These effects moy become apparent in from 4 doys to three weeks. Therefore, potients should be kept under close observation. Medicotion, in such cases, should be stopped for 2 to 6 days, then resumed ot a lower level. In potients with diabetes mellitus, look for possible chonges in metabolic activity which may affect insulin or other ontidiabetic drug dosoge requirements.

CONTRAINDICATIONS: Thyrotoxicosis, ocute myocordiol inforction.

SIDE EFFECTS: Side effects ore secondory to increosed rotes of body metobolism: sweoting, heort polpitotions with or without poin, leg cromps, weight loss, diarrheo, vomiting ond nervousness. Myxedematous patients with heart disease have died from obrupt increoses in dosoge of thyroid drugs. In most cases, o reduction in dosoge followed by o more gradual odjustment upward will indicate the potient's dosage requirements without the appeoronce of side effects.

DOSAGE AND ADMINISTRATION: In myxedematous stupor or como, with no evidence of severe heort diseose, 200 to 400 mcg. of SYNTHROID (sodium levothyroxine) INJECTION moy be odministered introvenously utilizing a solution containing 100 mcg. per ml. Detectoble effects ore usuolly observed by the sixth hour ofter injection and are fully opprecioted during the following doy. A repeat injection of 100 to 200 mcg. moy be given on the second day if significont improvement hos not occurred. The introvenous use of sodium levothyroxine in myxedemotous como is advantageous because it produces o predictoble increose in the concentrotion of protein-bound iodine, eliminotes the need for multiple doses until orol theropy is reinstoted, circumvents the uncertointy of orol obsorption, and ovoids the risk of pulmonory aspirotion.

SUPPLIED: SYNTHROID (sodium levothyroxine) INJECTION is supplied in 10 ml. vials containing 500 mcg. of lyophilized octive ingredient ond 10 mg. of Monnitol, N.F.; a 5 ml. vial contoining Sodium Chloride Injection, U.S.P. is provided os diluent.

Also supplied as SYNTHROID (sodium levothyroxine) TABLET in color coded compressed toblets, ond in seven strengths: 0.025 mg. (oronge), 0.05 mg. (white), 0.1 mg. (yellow), 0.15 mg. (violet), 0.2 mg. (pink), 0.3 mg. (green), ond 0.5 mg. (blue). Each strength is supplied in bottles of 100 ond 500 toblets.

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Injection

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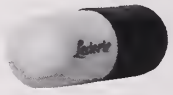

Every pharmacist knows ACHRO® V stands for ACHROMYCIN® V

Contraindications: Hypersensitivity to tetracycline.
Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.
Precautions: Nonsusceptible organisms may overgrow; treat superinfection appropriately. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).
Adverse Reactions: *Gastrointestinal*—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. *Skin*—maculopapular and erythematous rashes; exfoliative dermatitis; photosensitivity; onycholysis, nail discoloration. *Kidney*—dose-related rise in BUN. *Hypersensitivity reactions*—urticaria, angioneurotic edema, anaphylaxis. *Intracranial*—bulging fontanels in young infants. *Teeth*—yellow-brown staining; enamel hypoplasia. *Blood*—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. *Liver*—cholestasis at high dosage. Upon adverse reaction, stop medication and treat appropriately.

Achromycin® V
Tetracycline

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Picture of painful myositis

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Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility . . . stop pain-spasm feedback

by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]... but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

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References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

McNEIL

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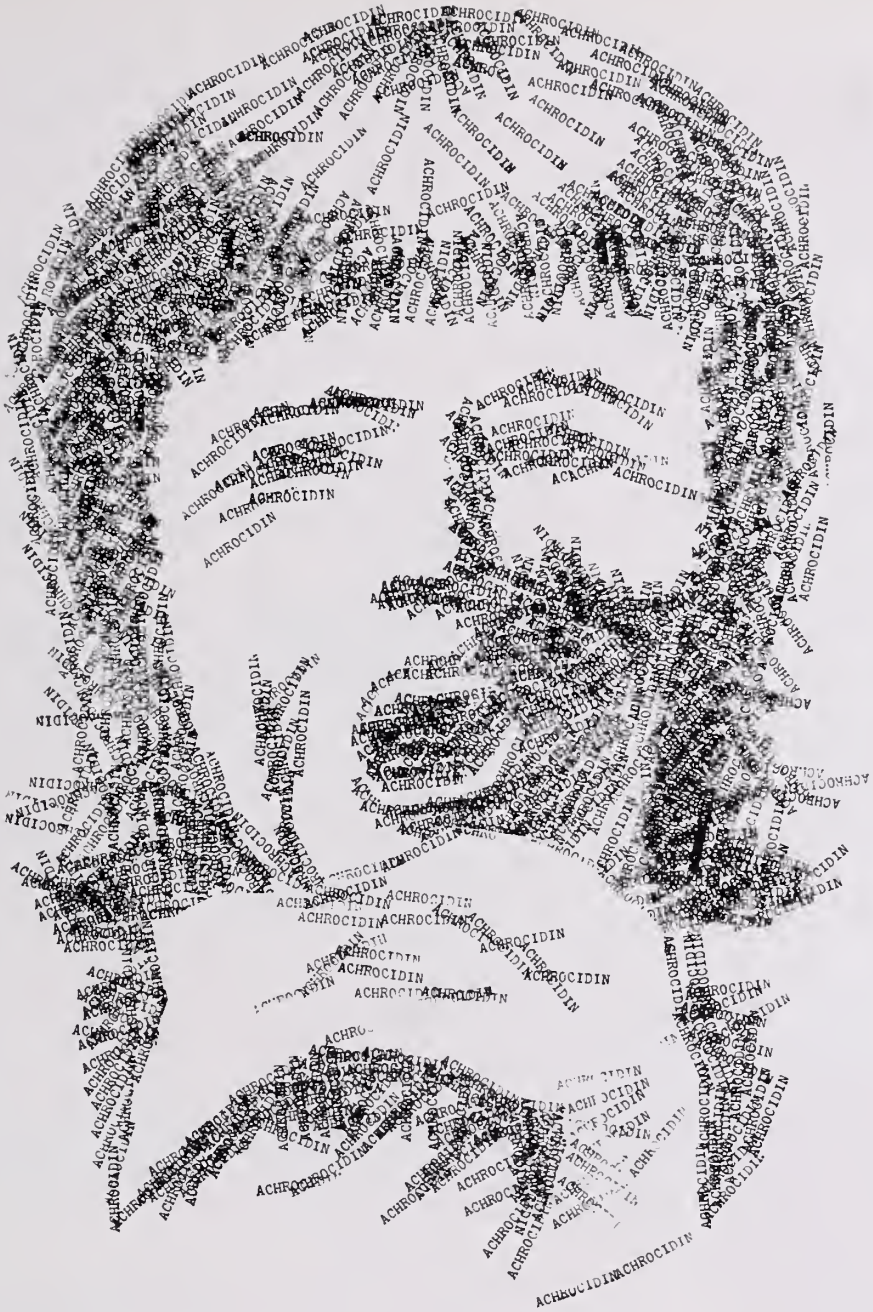

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Each tablet contains: ACHROMYCIN® Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Caffeine 30 mg.; Salicylamide 150 mg.; Chlorothen Citrate 25 mg.

ACHROCIDIN Tetracycline HCl—Antihistamine—Analgesic Compound Tablets and Syrup are recommended for the treatment of tetracycline-sensitive bacterial infection which may complicate vasomotor rhinitis, sinusitis and other allergic diseases of the upper respiratory tract, and for the concomitant symptomatic relief of headache and nasal congestion. For children and elderly patients you may prefer caffeine-free ACHROCIDIN Syrup. Each 5 cc contains: ACHROMYCIN Tetracycline equivalent to Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Salicylamide 150 mg.; Ascorbic Acid (C) 25 mg.; Pyrilamine Maleate 15 mg.

Contraindications: Hypersensitivity to any component.

Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.

Precautions: Drowsiness, anorexia, slight gastric distress can occur. In excessive drowsiness, consider longer dosage intervals. Persons on full dosage should not operate vehicles. Nonsusceptible organisms may overgrow; treat superinfection appropriately. Treat beta-hemolytic streptococcal infections at least 10 days to help prevent rheumatic fever or acute glomerulonephritis. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).

Adverse Reactions: *Gastrointestinal*—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. *Skin*—maculopapular and erythematous rashes; exfoliative dermatitis; photosensitivity; onycholysis, nail discoloration. *Kidney*—dose-related rise in BUN. *Hypersensitivity reactions*—urticaria, angioneurotic edema, anaphylaxis. *Intracranial*—bulging fontanels in young infants. *Teeth*—yellow-brown staining; enamel hypoplasia. *Blood*—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. *Liver*—cholestasis at high dosage.

Upon adverse reaction, stop medication and treat appropriately.

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Trocinate relaxes all smooth muscles. Its direct action (musculotropic) does not involve the autonomic nervous system and it is not mydriatic. It is metabolized by the body and eliminated in the urine as harmless degradation products. Trocinate has a remarkable history of freedom from side-effects.

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DIARRHEA (functional) . . . *the first 400 mg. tablet usually relieves the discomfort of diarrhea so promptly that it ceases to be a bother.*

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WARNING: Do not give in advanced kidney or liver disease. PRECAUTIONS: Trocinate relaxes all smooth muscles. Large dosage or prolonged usage may cause feeling of weakness or can theoretically precipitate gall-bladder colic, due to relaxing the vascular and duct systems. Caution should be observed in patients with urinary bladder obstruction. DOSAGE: 400 mg. May be repeated in 4 hours. After relief, lengthen the dose frequency. (see side note)

NOTE: *The high therapeutic index of Trocinate permits its administration in dosage sufficient to relieve smooth muscle spasm promptly. 400 mg. dosage usually creates a therapeutic blood level. In reducing dosage after relief, lengthening the time between dosage rather than lessening the recommended dose is preferable. The prompt direct action allows a consciousness of the first suggestion of return of symptom . . . a guide to dose spacing and to determining when treatment is complete. A prescription for twelve or sixteen 400 mg. tablets will usually correct spasm and leave a few tablets for a reserve.*

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The girth control pill

Tepanil® Ten-tab
(continuous release form)

(diethylpropion hydrochloride)

works on the appetite not on the 'nerves'

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Contraindications: Concurrently with MAO inhibitors, in patients hypersensitive to this drug; in emotionally unstable patients susceptible to drug abuse.

Warning: Although generally safer than the amphetamines, use with great caution in patients with severe hypertension or severe cardiovascular disease. Do not use during first trimester of pregnancy unless potential benefits outweigh potential risks.

Adverse Reactions: Rarely severe enough to require discontinuation of therapy, unpleasant symptoms with diethylpropion hydrochloride have been reported to occur in relatively low incidence. As is characteristic of sympathomimetic agents, it may occasionally cause *CNS effects* such as insomnia, nervousness, dizziness, anxiety, and jitteriness. In contrast, CNS depression has been reported. In a few epileptics an increase in convulsive episodes has been reported. *Sympathomimetic cardiovascular effects* reported include ones such as tachycardia, precordial pain, arrhythmia, palpitation, and increased blood pressure. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride; this was an isolated experience, which has not been reported by others. *Allergic phenomena* reported include such conditions as rash, urticaria, ecchymosis, and erythema. *Gastrointestinal effects* such as diarrhea, constipation, nausea, vomiting, and abdominal discomfort have been reported. Specific reports on the hematopoietic system include two each of bone marrow depression, agranulocytosis, and leukopenia. A variety of miscellaneous adverse reactions have been reported by physicians. These include complaints such as dry mouth, headache, dyspnea, menstrual upset, hair loss, muscle pain, decreased libido, dysuria, and polyuria.

Convenience of two dosage forms: TEPANIL Ten-tab tablets: One 75 mg. tablet daily, swallowed whole, in midmorning (10 a.m.); TEPANIL: One 25 mg. tablet three times daily, one hour before meals. If desired, an additional tablet may be given in midevening to overcome night hunger. Use in children under 12 years of age is not recommended.

T-006A / 1/70 / U S PATENT NO 3,001,910

THE NATIONAL DRUG COMPANY
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Painful night leg cramps...

unwelcome bedfellow for any patient– including those with arthritis, diabetes or PVD

One thing patients can sleep without, particularly patients with chronic disease conditions such as arthritis, diabetes or PVD, is painful night leg cramps. Although seldom the presenting complaint, night leg cramps can tie your patients up in painful knots. Now, just one tablet of QUINAMM at bedtime can usually bring an end to shattered sleep and needless suffering. Your patients will sleep restfully—gratefully—with QUINAMM, specific therapy to prevent painful night leg cramps.

Prescribing Information—Composition: Each white, beveled, compressed tablet contains: Quinine sulfate, 260 mg., Aminophylline, 195 mg. **Indications:** For the prevention and treatment of nocturnal and recumbency leg muscle cramps, including those associated with arthritis, diabetes, varicose veins, thrombophlebitis, arteriosclerosis and static foot deformities. **Contraindications:** QUINAMM is contraindicated in pregnancy because of its quinine content. **Precautions/Adverse Reactions:** Aminophylline may produce intestinal cramps in some instances, and quinine may produce symptoms of cinchonism, such as tinnitus, dizziness, and gastrointestinal disturbance. Discontinue use if ringing in the ears, deafness, skin rash, or visual disturbances occur. **Dosage:** One tablet upon retiring. Where necessary, dosage may be increased to one tablet following the evening meal and one tablet upon retiring. **Supplied:** Bottles of 100 and 500 tablets.

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(quinine sulfate 260 mg., ominophylline 195 mg.)

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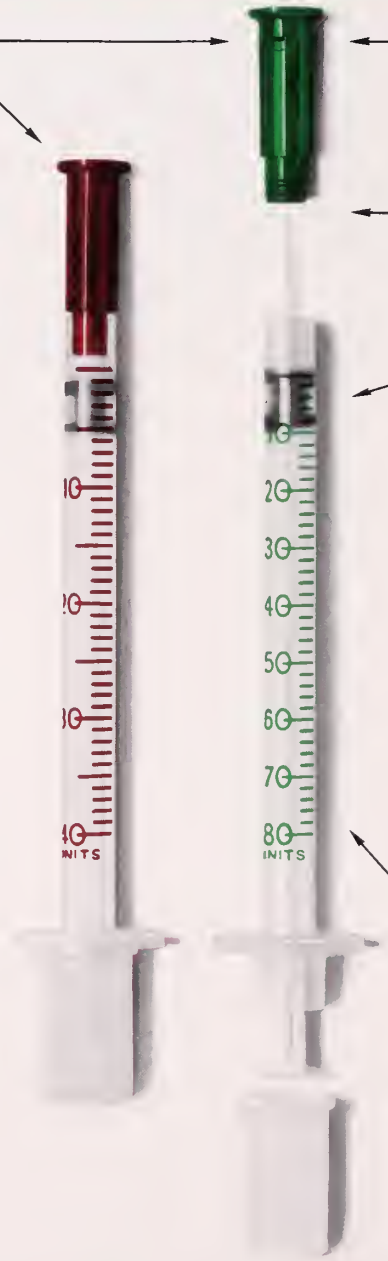

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Time to Repair Our Faltering Public Image

DURING THE past twelve months in which I have been privileged to serve first as a public relations consultant and later as executive secretary of the Wyoming State Medical Society, the genuine concern by doctors, both singly and in groups, over the medical profession's reputation in the ideas of the public, has been evidenced to me in a great many ways.

Doctors have told me that they deeply resent television "exposes" such as the recent CBS 3-part "Health in America" series. At a regional meeting of medical society executives, a frank discussion was held on the change that is taking place in the doctor's image. In practically every meeting of medical groups which I have attended, this topic was touched upon, either as a formal item on the agenda or in informal conversation. Many individual physicians have voiced their concern and also admitted that "they felt totally unequipped to do anything about the situation."

Interestingly enough, the total impression changes when you talk to the individual about how his patients feel. In most cases, we can observe the highly-valued doctor-patient relationships still operating. And, perhaps, this is the ultimate key to our problem. For the most part, patients in Wyoming respect the individual doctor and his abilities, do not feel they are being "over-charged," and feel that the doctor does have a personal interest in their welfare—because they have firsthand knowledge of the physician and his efforts.

Patients in general do not know what the AMA, Wyoming State Medical Society, County Medical Society, or physicians in a specific city or town are, think, or whether they care. The immediate reaction of some physicians may be—"Well, they should know that I and my group strongly support local health programs and many other civic projects." But the truth of the matter is that the general public doesn't know what the medical profession is doing; they don't understand, for example, that most doctors don't make house calls because it's an extremely inefficient way to practice medicine.

By conservative estimate, the average citizen is bombarded with more than 200 advertisements and news items during a normal day. How many of these in your experience are explaining the problems of health care from the physician's point of view? How many times does the medical profession wait until it is attacked before it launches an information or educational effort?

Only when doctors and their professional organizations—local, county, state and national—examine the basic problems of health care FROM THE CONSUMER'S VIEWPOINT and explain their procedures, charges and beliefs in this context, not once, but on a continuing basis, will the medical profession and individual physicians begin to see an ebbing in the tide of criticism to which they are now being subjected.

The time is long past when our society was elemental enough for "good works to speak for themselves." We, in medical organizations, and the individual physician must devote part of our efforts in improving health care to also explain the dramatic changes in health care and how the physician in private practice can be a vital part of the "new" scene.

One fact is certain—the task of telling the doctor's story becomes more complicated with each passing season, and the longer we delay in undertaking an effective program of information and education so that the health care consumer, the "man on the street," understands our reasoning, philosophy and efforts, the more monumental project we are facing.

Robert G. Smith,
Executive Secretary,
Wyo. State Med. Soc.

Drug Abuse and Rehabilitation in Wyoming

As readers of this journal are probably aware, Wyoming has been cursed by the use of drugs by our youth. Sad to say, this use, or abuse, has been extensive. It has crept from the college level down through our high school and junior high school levels. Aside from those directly involved, our doctors, lawyers, and police are probably the major groups to have the unpleasant experience of seeing the results firsthand. Virtually indescribable tragedy has followed in the wake of this melancholy holocaust. We are incapable of assessing the terrible damage to the youthful drug users, their brothers and sisters, their mothers and fathers, teachers, relatives, and friends. The term "broken-hearted" on a wholesale scale accurately describes the end result to everyone involved.

Despite this calamitous misfortune, Wyoming has several reasons to feel optimistic about the future. The people and the press have openly recognized and publicized the problem and have made no attempt to minimize its seriousness. This, in turn, has led to a general awareness of the problem and has made attempts to combat drug abuse much more effective. Local doctors have "taken the bull by the horns" and have instituted programs in their own communities, along with attorneys, police, and clergy.

Our State Medical Society, State Health Department, and State Department of Education have instituted a far-ranging educational program designed to be a permanent part of the curriculum, which will attack drug abuse through the educational process on a continuing basis over a period of many years. This program is likely to become a national model. We have been fortunate in receiving support and help from knowledgeable people throughout the entire Rocky Mountain area. In addition, the Mental Health Divisions of the Western Interstate Commission on Higher Education and the U.S.P.H.S. were "godsends" to us when we needed help in a hurry—which, indeed, we did receive.

Not the least of those things for which we may be thankful is the progressive and pioneering effort of our Wyoming State Hospital. These efforts are detailed in an article in this issue of the *Journal*, and I am sure that our friends in other States will find this program of real interest.

All in all, as a result of cooperative efforts of everyone involved, we in Wyoming can at least feel that we have recognized a serious problem and have attacked it strenuously and intelligently.

Francis A. Barrett, MD*,
Cheyenne, Wyoming

Let Us Bolster Our Medical Manpower

Today I was leafing through the American Medical News and in the letters section saw a short note from Dr. Don Ridgway of Paonia. I hate to admit it, but I don't know where Paonia is although I thought I knew every place in Colorado from Julesburg to Cortez and back up to the northwest corner to Sparks and down to Springfield in the southeast. That's only half of my tale of woe because I don't know Dr. Don Ridgway either, but it sounds to me like this man, in a few words, comes forth with a lot of sense. In his last paragraph he says, "It is time medical schools returned to doing the job for which they were created—to train doctors to treat people."

The only three states in this great country of ours that are not equipped with a medical school lie in our Rocky Mountain Region—Idaho, Montana and Wyoming. It looks like now, for the first time, we are starting to get a few of the grass roots growing to correct this situation. It's high time. Each of these three states seems to suffer from many of the same problems. Our physicians are older by 11 years than the national average, and our physician shortage is yearly becoming more acute.

*Scientific Editor for Wyoming.

It seems to me that these problems arise directly from several situations. The first is that there were over 18,000 applications, supposedly all from qualified young people, to medical schools in the fall of 1969 and only slightly more than 9,000 were accepted. Therefore, it is obvious that we need more first year slots in medical schools if we are going to train more physicians to alleviate our regional and national shortage of physicians. Second, the physician from one of our states who is trained elsewhere is much more apt to remain and practice in the area where he is trained than he is to return to his home area. National statistics bear this point out when they state that in excess of 50 per cent of all new physicians remain in the area where they have received a portion of their training while only 13 per cent return to the state where they make their home. Finally, and more to the point of Dr. Don's short note, more and more young men being trained in our medical schools are being diverted to research areas and so-called "grantsmanship" projects. Add to these the sad reality that the number of physicians trained to treat people and returning to rural areas to practice is rapidly diminishing.

Recently, some of the officers of the state medical societies from Idaho, Montana and Wyoming have had several informal meetings to investigate the possibility of medical education in our three-state area. The Western Interstate Council on Higher Education has also submitted a grant application to aid in planning for medical education, and, all in all, things look promising for us to have a chance to train doctors to treat people in the Rocky Mountain area.

We, here in the beautiful Rocky Mountain West have been asked, as have physicians elsewhere, to take a long hard look at our health care delivery system to see what we can do to improve it. I think that, first and foremost, we have to have enough physicians to provide health care for our farflung population. The approach, now being considered, seems to offer hope. The seed has been planted; the grass roots are moving. I would like to encourage every physician in the Rocky Mountain West to become involved, in some small way, in the effort to provide more doctors to treat people.

John J. Corbett, MD, President,
Wyoming State Medical Society
Casper, Wyoming

Reaction to Biased TV Programs

The following is a letter to Frank Stanton, President of CBS in New York City, written by one of our New Mexico colleagues in response to certain reprehensible TV programs:

Dear Sir:

I am writing you in regard to the CBS Special TV programs presented April 20 and 21 pertaining to health care in America. I am a hard working, honest, capable, dedicated general practitioner of medicine. I have had fifteen years experience and am well versed in medical and health care. I am a member of AMA, American Academy of General Practice, and also a member of Board of Directors of New Mexico Blue Shield.

In my opinion this program you presented was one of the worst I have ever seen. It was full of half truths, innuendoes, and an insult to the medical profession. Your program was so full of misinformation, I will not endeavor to point out all of your mistakes. I am enclosing some information that should be helpful to you if you are really interested in the truth.

For the past few years the TV and all forms of news media apparently have not sought the truth or facts. You, not the doctors, are really the only ones that are interested in making money.

Your program was a direct, scandalous, slanted, bigoted, attack on the greatest profession in the world. American medicine is far and above all other types anywhere in the world. The suggestion of National Health Insurance for everyone is a direct step toward socialized medicine, government medicine, and socialism which is deplorable.

Apparently CBS is again trying to influence and dictate government policy by slanted news programs. In recent months, I have read that many of the news commentators, news analysts and officials of the three major networks do not have the best interest of the U.S. at heart and probably are not loyal Americans.

I too, will agree with Vice President Agnew when he spoke out against your type. When you begin trying to run down one group or profession you had better have a long, hard look at your own house. In spite of your misguided thoughts, American medicine is still best. You should talk to many people who live in countries that have your kind of socialized medicine.

The title "DON'T GET SICK IN AMERICA" should be enough to make any patriotic American sick, although I am sure you know many people who go along with your inept titles. I also know there are many people living here in the United States that are not patriotic Americans and do not believe in freedom and democracy as the majority of us do.

I am sure you will be hearing from many of my colleagues.

Copies of this letter are being sent to United States Senators and Representatives and all other interested parties.

B. W. WILLIAMS, M.D.
Las Cruces, N.M.

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Cholelithiasis in childhood*

John J. Corbett, MD, and Walter B. Watson, MD
Casper, Wyoming

It is the purpose of this paper to review the etiology of gallstones in children and the diagnostic procedures available to aid in definitive diagnosis and treatment.

PRIMARY GALLBLADDER DISEASE in children was first described by Gibson in 1722. Since that time, Potter, Ulin, and others have reviewed the literature extensively. Frank Glenn noted that less than four hundred cases of proven gallbladder disease in children had been reported through the year 1953, at which time he reported an additional seven cases in over a period of twenty years in the pediatric and surgical pavilions of the New York hospital, Cornell Medical Center. Gross reports only six patients operated for cholelithiasis at Boston Children's Hospital through that same year, and of these six, three were found to have some type of hemolytic anemia.

Over the past twenty years, case reports of cholelithiasis in childhood and adolescents have appeared fairly regularly, and between 1947 and 1957, twenty-four cases were reported in the English literature. Walker reported, in 1957, nine cases of proven gallstones seen at the Hospital for Sick Children, Great Ormond Street, London, and states that, in these cases, stones were often associated with hemolytic anemias and that two of the nine cases were found in association with erythroblastosis fetalis. He also reports one case of multiple stones found in a girl having a history of neonatal sepsis with cavernomatous malformation of the portal vein and associated portal hypertension. His remaining three cases were reviewed extensively in the Archives of Diseases of Children in 1957, and one was attributed to segmental stenosis of the cystic duct and the remaining two were said to be of unknown etiology.

*From the Departments of Pediatrics and Surgery, Memorial Hospital, Natrona County, Casper, Wyo.

CASE REPORT

This six-year-old white female was admitted to Natrona County Memorial Hospital with a history of recurring, vague, abdominal pain of one year's duration. She had had one severe attack of upper abdominal colic. X-rays, which were taken by her referring physician in Riverton, Wyoming, were indicative of a solitary gallstone. Her birth weight was 8 pounds 2 ounces and her length was 21 inches. In her neonatal period her weight dropped from eight pounds to five pounds, and it was postulated that she may have had a blood stream infection and dehydration. There was no known blood dyscrasia. The mother denied any significant pallor or jaundice with the present illness and stated that her appetite had been fair and her bowel habits had been normal.

On physical examination her temperature was 98.4, pulse rate, 80, and blood pressure 94/70.

There was no evidence of scleral icterus. There were palpable anterior and posterior cervical lymph nodes, none of which were tender. Lungs were clear to percussion and auscultation, and the heart had a normal sinus rhythm without murmurs or gross enlargement. On examination of the abdomen, there was minimal tenderness in the right upper abdominal quadrant accompanied by very slight guarding; there was a small umbilical hernia and no palpable organomegaly; the bowel sounds were present and normal. The remainder of the physical examination was within normal limits.

Laboratory findings: Complete blood count revealed white count of 10,200 with a Schilling differential of 2 per cent Eosinophiles, 1 per cent Stabs, 43 per cent Segs, 54 per cent Lymphocytes. Hemoglobin was 13.4 grams and Hematocrit 35 vol. per cent. Reticulocyte count was 0.9 per cent; Platelets appeared adequate. The urinalysis was within normal limits. Direct Coombs test was negative; Bilirubin was 0.33 mg. per cent with 0.10 mg. per cent direct, 0.23 mg. per cent indirect, the Glucose six phosphate dehydrogenase determination was 20 minutes with the normal being 20-100 minutes. The peripheral smear revealed no spherocytes. Red cell fragility study was done which revealed initial hemolysis at 0.45 per cent sodium chloride and complete hemolysis at 0.3 per cent sodium chloride with the curve lying completely within normal range and, therefore, no evidence of either thalassemia or hereditary spherocytosis.

Her SMA 12/60 screening panel, which included determinations of glucose, blood urea nitrogen, uric acid, cholesterol, total protein, albumin, total bilirubin, LDH and SGOT were completely within normal limits. Inorganic phosphorous and alkaline phosphatase were within normal limits for her age.

Lipoprotein electrophoresis was done on two separate occasions. The initial result was suggestive of a minimal increase in the beta band which would have been indicative of a Type II hyperlipidemia which sometimes is associated with formation of biliary calculi, as well as cutaneous and vascular deposition of cholesterol. Repeat pheno typing of the lipoproteins, however, by a second laboratory were done and at that time the total cholesterol was within normal limits at 140 mg. per cent and the triglycerides were 64 mg. per cent. There was, on the second independent determination, a normal staining beta band which would have to be interpreted as a normal non-hyperlipidemic serum or a Type II treated patient. Our patient had had no specific therapy, either with dietary restriction or medication. Pathology report confirmed chronic Cholecystitis with cholelithiasis and analysis of the removed biliary calculus revealed it to be composed of 80 per cent calcium carbonate, 10 per cent cholesterol, and 10 per cent mixed bile salts.

Hospital course: The day following admission the patient had cholecystectomy. Postoperative course was uneventful and she was discharged on her sixth postoperative day and she was followed on an outpatient basis and returned to her referring physician for further care.

Discussion

Paracelsus, in 1500, was the first person to comment on the origin of gallstones. He advanced the theory that certain chemical disturbances in the body initiated the precipitation of impurities in the biliary ducts. In 1565 Kentman attributed gallstones to bile combustion, utilizing the theory that the heat of the liver caused the bile to "burn up." Subsequent to these early writers, a voluminous amount of clinical and experimental data concerning the origin of cholelithiasis has been accumulated. Although much light has been thrown on the subject ,the exact mechanism of gallstone genesis is still in doubt. Certainly the conditions responsible for the occurrence of the different types of biliary calculi are not precisely identified.

The role of the reaction of bile in the genesis of gallstones was stressed by Drury and others in 1924. According to his thesis, the normal gallbladder acidifies liver bile and perhaps in this way prevents calcium carbonate and other ingredients of gallstones from coming out of solution. It was thought that any factor that interferes with the normal acidification of bile in the gallbladder may then be involved in stone formation. The reaction of bile, per se, has been given little attention in the study of gallstone genesis by more recent investigators. Dostal and Andrews reported that in their hands, decreased concentration of both bile acids and fatty acids in gallbladder bile were factors leading to the precipitation of cholesterol or bilirubin. How these changes are brought about are not clear. Mechanical factors, such as an initial nucleus of sloughed epithelial particles or inflammatory debris, are not considered by most investigators to be responsible for the formation within the gallbladder of the common types of calculi.

Gross makes the point that the concurrence of biliary calculi and hemolytic anemia is so frequent that cholelithiasis in childhood should always arouse suspicion of a blood disorder, and cholelithiasis should never be treated without due regard for the blood picture. Not only must the stone be removed, but the reason for its formation must also be corrected if an anemia is found. When a diagnosis of cholelithiasis has been confirmed by roentgenologic means or by signs of biliary obstruction, exploration and removal of the stone is in order. He states that if the calculi lie wholly within the gallbladder, cholecystectomy can be done but if the gallbladder wall is not thickened cholecystostomy

and removal of the stones may be all that is necessary. He stresses that this is particularly true if the patient has congenital hemolytic anemia which has been corrected or which is going to be corrected by splenectomy. Under these circumstances, the chance of future formation of stones is minimal and the gallbladder can be saved with impunity.

In the patient who had both hemolytis anemia and cholelithiasis the question arises whether it is preferable to correct the hemolytic process or remove the calculi first. This decision must depend upon the conditions in a given case. In general, however, it is better to perform the splenectomy first and to remove the calculi at a later date. However, if the patient has common duct obstruction or obstruction of the cystic duct with a symptomatic empyema of the gallbladder the biliary surgery should naturally be done first. Gross states that in no case should cholecystectomy, or common duct exploration be combined with splenectomy because the combination carries too high an operative risk.

I believe that in any case where cholelithiasis exists removal of the gallbladder is in order. I feel this way because of reports in the literature of calculus formation about sutures, because of a case reported by Walker of calculus formation due to stasis from a stenotic cystic duct, and because of the accepted incidence of between ten and twenty per cent of calculus formation of unknown etiology. In our case, the gallbladder wall appeared to be slightly thickened. In the workup of our patient, we considered the hemolytic anemias prior to her admission to the hospital, in the interest of saving hospital costs, and were unable to prove any occult or frank anemia or blood dyscrasia.

As mentioned earlier, the hemolytic anemias are associated with the greatly increased frequency of cholelithiasis although Soderlund and Zetterstrom noted hemolytic anemia in only three of sixty children operated upon for cholelithiasis. Cholelithiasis was noted in forty of ninety-three cases (43 per cent) of familial hemolytic anemia reported by Bates and Brown. They found the frequency of stones to increase with severity and duration of the hemolytic process and the age of the patient. 80 per cent of patients with cholelithiasis in Jordan's series of cases with sickle cell disease were under thirty years of age. Gallstones, in association with hemolytic anemia, occur much earlier in life than the usually reported age incidence for cholelithiasis. Because of the increased incidence of biliary calculi in patients with a Type II hyperlipidemia, this possibility was also investigated but was not proven.

In discussing the etiology of gallstones, it is important to point out that stones have been described with the fetus still in utero, usually associated with intrauterine cholecystitis. In general, the proneness of the female to gallstones seems less marked in childhood than in adults. Racial selection seems to be directly related to the presence or absence of congenital hemolytic anemias and spherocytosis and when a geographical incidence is discussed, it is noted that the incidence of stones within the white race varies from one place to another suggesting dietetic and environmental factors yet unrecognized. As concerns the role of cholecystitis and formation of gallstones, Ladd and Gross, in 1941, stated that in children gallstones are more common than cholecystitis. With control of typhoid, scarlet fever, and upper respiratory infections this is probably true, although in reviewing the literature this apparently has not always been the case. In the presence of long standing disease it is difficult to decide whether the stone or the inflammation was primary.

Perhaps too little attention has been paid to the possibility that macroscopic or microscopic abnormalities of the bile duct system could be the primary cause of obstruction leading to stagnation and stone formation. Forshall and Rickham, in 1954, reported four cases in which minor anatomical abnormalities were responsible and similar findings are recorded by Bogatko and Mehlman in 1947 and by Walker in 1957. The importance of dehydration and the presence of partial or complete obstruction of the biliary tract is obvious but other mechanisms have been suggested to account for the occurrence of stones in the absence of infection or of obstruction. Sodeman, in 1950, suggested that the absence of bile salts caused precipitation of cholesterol and stone formation and

Rankin, in 1955, in describing acute distention of the gallbladder suggests biliary dyskienesia as a cause. If such a condition exists, it could obviously play a part in the production of stones.

Reference has been made in the literature to spontaneous disappearance of gallstones. This happens so very rarely that any decision concerning treatment need not be based upon this happenstance. No satisfactory clinical method is known for the dissolution of calculi within the gallbladder. There is ample clinical and statistical evidence to support the conclusion that patients with gallstones face a somewhat reduced life expectancy. The frequency of complications is not insignificant. Even in the absence of the dramatic appearance of acute cholecystitis or choledocholithiasis with their numerous complications, the danger of insiduously developing complications would seem to make operative intervention advisable.

Summary

A case of cholelithiasis in a six-year-old white female is presented. The factors contributing to the etiology of gallstones are reviewed and the diagnosis and management of our case has been discussed. •

ACKNOWLEDGEMENT

I wish to thank Dr. Karl Hunt in Riverton and Dr. Walter Watson from Casper for the opportunity of sharing this patient's care and for their invaluable assistance in the preparation of this paper.

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Syndrome of inappropriate ADH (SIADH)

David F. Cook, MD, Jackson, Wyo.

A distinct clinical entity frequently overlooked in differential diagnosis.

Approximately twenty years ago a condition of hyponatremia was described by Sims, et al, in a patient with tuberculosis. A year later renal salt loss in tuberculous meningitis was observed by Rapaport. Six years later, two patients with bronchogenic carcinoma were described by Schwartz, and their concomitant hyponatremia was attributed to renal sodium loss resulting from inappropriate secretion of antidiuretic hormone. Since that article in 1957, SIADH has been reported in a variety of illnesses (Table 1).

This syndrome in the clinical setting was first brought to my attention as an intern in 1961. A patient with tuberculosis and hyponatremia (not due to inappropriate ADH) was presented on rounds to an astute preceptor. SIADH was brought up, and despite a rather lengthy explanation, I didn't understand it. That was unfortunate, for less than two years later, as a medical resident, I was faced with a comatose woman who did have SIADH. But, of course, I didn't know it.

This case presentation is not meant to be a complete patient workup, because I cannot remember all of the details. It is intended to exemplify the Syndrome of Inappropriate ADH Secretion and illustrate some of the physical and laboratory findings of this syndrome. A few years ago this syndrome seemed esoteric, and reports were few and far between. But in recent years, the list of disease states in which SIADH has been described (Table 2) has grown such that some knowledge and understanding of this abnormality is necessary to all physicians, regardless of specialty.

TABLE 1
CHRONOLOGY OF SIADH

1950—Simes et al—Asymptomatic hyponatremia in pulmonary tuberculosis
1951—Rapoport et al—Salt losing conditions in tuberculous meningitis
1954—Dudley et al—Effects of anesthesia, surgery and ADH on water metabolism in man
1956—Curtis—Case report of hyponatremia in myxedema 1965 — Pettinger — SIADH in myxedema
1956—Nyhan and Cooke — Symptomatic hyponatremia in CNS infections
1957—Schwartz—2 patients with bronchogenic CA with hyponatremia
1958—Kleeman et al—Mechanisms of impaired water excretion in adrenal and pituitary insufficiency
1959—Jaenike and Waterhouse—Hyponatremia in CHF
1960—Goldberg—Hyponatremia in CNS disease
1962—Stormont and Waterhouse—Hyponatremia associated with pneumonia
1962—Hellman—Hyponatremia in acute intermporphyric
1962—Grumer—Idiopathic SIADH
1965—Knochel—SIADH following head trauma

CASE REPORT

Present Illness: A 67-year-old woman was admitted by ambulance, having been found comatose in bed at home by her landlady. The only history available was from the landlady, who said the patient had been feeling poorly for the past week or so with a chest cold. A bottle of hygroton tablets was found in the patient's apartment. A limited past history was obtained from the patient's family physician who had seen her sporadically in recent years for treatment of hypertension and there had been mild swelling of ankles.

TABLE 2

SYNDROMES IN WHICH THERE IS PROBABLY INAPPROPRIATE ELABORATION OF ADH

1. Malignant Tumors
   - Carcinoma of the lung
   - Carcinoma of the duodenum
   - Carcinoma of the pancreas
   - Thymoma
2. Disease of the Lung
   - Tuberculosis
   - Cavitation (aspergillosis)
   - Pneumonitis
3. CNS Disturbances
   - Meningitis
   - Head trauma
   - Encephalitis
   - Neoplasm
   - CVA
   - Brain abscess
   - Guillain—Barre
   - Pituitary Irradiation
   - Epilepsy
   - Miscellaneous
4. Metabolic
   - Myxedema
   - Acute Intermittent Porphyria
5. Miscellaneous
   - Idiopathic
   - Hodgkins
   - Post—Commissurotomy
   - Post—Op
   - CHF
   - Cirrhosis

Physical Examination: BP was 150/94; pulse, 102; resp., 16; and temp., 100.2. Fundi showed mild A-V nicking and were otherwise normal. The neck veins were flat; thyroid not enlarged and there were palpable cervical nodes bilaterally. The chest was clear to P and A. The heart showed mild to moderate left vent. enlargement to palpation; there was no gallop. A gr. II apical systolic murmur was present. The liver not enlarged; spleen tip was palpable. There were no masses; bowel sounds were hypoactive. Extremities showed no edema, no rashes.

Laboratory: Hct. was 36%; Na, 118; K, 4.2; and BUN 7. Urine, spec. gr., 1.012; serum osmolality, 225 mOs/Kg.; urine osmolality, 635 mOs/Kg; urine Na, 84 meq/24 hr.

The physical examination as described, afforded little information to account for the patient's state of unconsciousness. However, the laboratory data, abbreviated above, shed a great deal of light on the patient's illness. I should qualify this case presentation by saying that it is most unusual for this syndrome to present with such severe manifestations. More commonly it is insidious in its expression, with gradually increasing malaise, weakness, and sometimes nausea and vomiting. It should be remembered also that thiazide diuretics may greatly enhance the severity of this disorder.

Cardinal Features

The cardinal features of SIADH (Table 3) are (1, 2) hyponatremia with corresponding plasma hypo-osmolality; (3) increased extracellular fluid volume, but with (4) urine less than maximally dilute; (5) normal renal and adrenal function; (6) absence of edema; (7) absence of hypokalemia, and sometimes, (8) urinary excretion of significant amounts of sodium despite hyponatremia. I preface this with "sometimes" because the urinary excretion of sodium in these patients is dependent upon the intake of sodium at that time. A completely sodium free diet will be reflected in the urine by less sodium excretion. We will discuss this more later.

First a word about the renal metabolism of water. Free water is the difference between the actual volume of urine and the volume it would be if the total urinary solutes were isoosmotic with the serum. Normal serum osmolality is approximately 290 plus or minus 5 mosm/Kg. Serum osmolality may be roughly estimated as twice the sum of the serum sodium and potassium concentrations provided hyperlipemia, hyperproteinemia, azotemia, or hyperglycemia are not present.

More than 60 per cent of water and sodium in the glomerular filtrate is passively reabsorbed in isotonic proportions in the proximal tubule of the kidney. This function is independent of ADH action. In the ascending limb of the loop of Henle, which is relatively impermeable to water, sodium is pumped actively from the luminal urine into the interstitial tissue of the medulla (Fig. 1). The countercurrent exchange mechanism, with increasing interstitial fluid accumulation of solute as you proceed from cortex to deep medulla, results in a hypertonic urine in the descending limb, which is permeable to water, and gradually increasing urine hypotonicity in the water impermeable ascending limb.

In the distal tubule and collecting ducts sodium reabsorption is aldosterone dependent, and in the absence of ADH, the urine is rendered hypotonic and free water is excreted. If, on the other hand, ADH is present (Fig. 2), water is reabsorbed from the distal

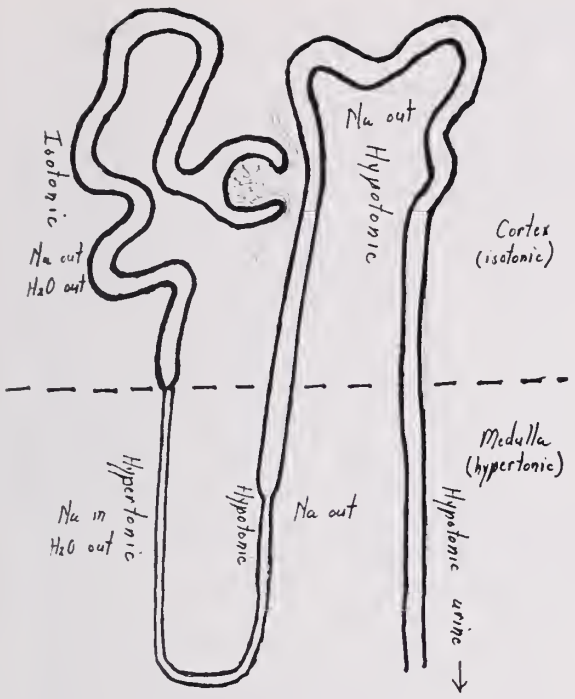

Fig. 1. Water Diuresis without ADH.

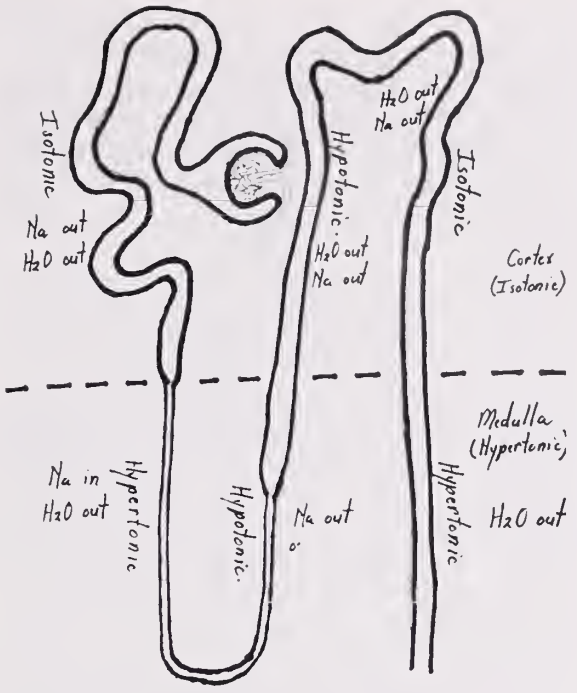

Fig. 2. Antidiuresis with ADH.

tubule and the urine becomes isoosmotic with the environment resulting in increasing hypertonicity of the urine as it proceeds through the collecting ducts. Therefore, ADH is necessary to make urine hyperosmolar to plasma.

ADH secretion is normally dependent upon serum osmolality. As osmolality increases ADH is secreted resulting in free water reabsorption at the distal tubule and collecting ducts. Extracellular fluid volume is also a minor factor in ADH secretion. As volume increases ADH secretion is inhibited, and conversely. The mechanism of ADH action is unknown, but it is postulated that it enlarges already existing pores in the distal tubules and collecting ducts, allowing easier water reabsorption.

The Syndrome of Inappropriate Secretion of ADH (SIADH) is analogous to experiments in which pitressin has been administered to individuals given free access to water. Such individuals retain water, gain weight, and develop dilutional hyponatremia. At the same time, glomerular filtration increases, renal sodium excretion rises, and sodium balance becomes negative despite normal sodium intake.

Three factors have been offered to explain the renal sodium loss in SIADH, (Table 4): (1) Suppression of aldosterone secretion resulting from an increase in extracellular fluid, volume. Juxtaglomerular stretch receptors produce less renin and, in turn, less angiotensin and less aldosterone is produced. (2) Increased extracellular fluid volume may result in an increased GFR with increased filtered sodium and a greater urinary excretion of sodium. (3) The not-too-well elucidated "third factor" effect may suppress sodium reabsorption in the proximal tubule as a result of expansion of ECF volume.

Against the aldosterone theory in SIADH are experiments in which administration of sodium retaining steroids (5 mg. of desoxycorticosterone/day) does not produce significant sodium retention or correct the hyponatremia in patients with this syndrome. Even in the pitressin experiments, the sodium loss is not prevented by administration of steroids. Numerous experiments have shown that there need not be an increase in filtered sodium to cause hyponatremia in the pitressin treated patients. It would appear, therefore, that the "third factor" may be the crucial mechanism in this syndrome. Phys-

iologic experiments have shown that acute expansion of the extracellular fluid volume will inhibit proximal sodium reabsorption and produce a sodium diuresis even when large doses of sodium retaining steroids are given and when an increase in GFR is prevented by partial clamping of the renal artery.

It would appear that patients with SIADH proceed to lose sodium and retain water until a critical serum sodium level is reached somewhere between normal and 100 meg, per L., at which time a new "steady state" is reached. From this point sodium excretion seems to reflect sodium intake. For example, on a sodium free intake urinary excretion of sodium will approach O. Conversely, infusion of hypertonic saline typically is followed by prompt elimination of nearly all the sodium in the urine.

If we refer again to Table 2 we can see that a variety of clinical states have been associated with SIADH. Generally, though, we can divide these into four major disease categories: (1) malignant tumors; (2) diseases of the lung; (3) CNS disturbances, and (4) metabolic derangements. In the tumor associated cases there is strong reason to believe that production of ADH, or a closely related polypeptide, by the tumor itself is responsible for the disorder. In patients with intrathoracic diseases it is postulated that stimulation of baroreceptors in the left atrium or carotid sinus and aortic arch initiate and sustain the continuous hormone production. In central nervous system disease, on the other hand, the presumed mechanism is somewhat different. Abnormal stimulation of the hypothalamic supraoptic hypophyseal nuclei or areas of the reticular formation, limbic system, or cerebral cortex that have neuronal connections with these nuclei, is considered to be the cause in these instances. In metabolic derangements, including congestive failure and other miscellaneous disorders, inappropriate ADH has been implicated in the generation of hyponatremic states, but without elucidation of the mechanisms of its inappropriate secretion. In certain of these disease states such as congestive failure and cirrhosis of the liver, the syndrome, if present, is atypical since the urinary excretion of sodium is usually low.

Despite the fairly obvious features of SIADH (Table 3) making it readily diagnosed under usual circumstances, it does become necessary to differentiate it from other disorders characterized by hyponatremia (Table 5). SIADH is associated with an expansion rather than a contraction of extracellular fluid volume. Therefore, the common clinical manifestations of dehydration, such as hypotension, decreased tissue, turgor, elevated BUN etc. seen in massive diarrhea and prolonged vomiting are absent in SIADH. Urine volume remains normal with normal specific gravity, and serum osmolality is decreased rather than increased.

More difficult, is the differentiation of SIADH from syndromes in which there is circulatory insufficiency and hyponatremia with increased extracellular fluid volume, as in congestive failure, cirrhosis or nephrosis. Clinically, the greatest clue is the presence of edema in the latter. Specific gravity is usually low, with decrease in urinary sodium excretion, and of course, the glomerular filbration rate, as measured by creatinine clearance, is characteristically low in circulatory insufficiency.

TABLE 3
FEATURES OF SIADH

1. Hyponatremia
2. Plasma HYPOsmolality
3. INCREASED ECF volume
4. urine less than maximally dilute
5. normal renal and adrenal function
6. ABSENCE OF EDEMA
7. Absence of hypokalemia
8. (urinary excretion of significant amounts of sodium despite hyponatremia)

TABLE 4
POSSIBLE MECHANISMS OF SODIUM LOSS IN SIADH

1. Suppression of aldosterone secretion resulting from an increase of extracellular fluid volume (juxtaglomerular apparatus — less renin — less angio—tensin—less aldosterone)
2. Increase in filtered load of sodium due to increased GFR
3. Suppression of proximal tubular reabsorption of sodium in response to increased extracellular fluid volume (alleged "third factor" effect)

TABLE 5
DIFFERENTIAL DIAGNOSIS

Syndrome	Examples	Appearance	URINE	Serum Na	Serum K	Serum BUN	Osmolality Serum	Osmolality Urine	Urine Na	GFR
Hyponatremia Circulatory Insufficiency Decreased ECF Volume	Diarrhea Emesis Adrenal Insuf. Salt Wasting Renal Dis. Diuretic Abuse	Dehydrated Hypotensive	Obliguric High Sp. Gravity	—	—	N OR +	N OR +	N OR —	N OR —	—
Hyponatremia Circulatory Insufficiency Increased ECF Volume	Cirrhosis Cardiac Failure Nephrosis	Edematous	N or + Low Spec. Gravity	—	N OR —	+ N —	N OR —	N OR —	——	——
Hyponatremia Adequate Circulation Expanded ECF Volume	SIADH	No Edema No Dehydration Sx of water Intox.	N Not Maximally Dil.	—	N	N OR —	—	N OR +	N OR + (?)	N OR +

TABLE 6
TREATMENT OF SIADH

1. Treat underlying disease.
2. Fluid restriction (5-700 cc/day)
3. Hypertonic saline infusion.
4. Steroids (?).
5. Ethacrynic acid (??).

The only disorder in which serious confusion may arise, and where diagnostic and therapecuitic error may have truly serious consequences, is in primary adrenal insufficiency occurring in the presence of SIADH. When clinical signs of Addison's Disease are minimal or lacking, the underlying disease state may be overlooked and immediate replacement of steroids omitted. For this reason, any patient suspected of having SIADH, should, if possible, have plasma corticoid levels determined.

The treatment of SIADH is relatively straight forward (Table 6). If possible, therapy of the underlying disease should be attempted. With the resection of tumors secreating ADH the syndrome has been shown to disappear. Conversely, in a few cases of recurrence of such tumors, hyponatremia has reappeared. Treatment of tumors with nitrogen mustard and other modes of chemotherapy as well as irradiation, have had variable results in alleviation of the syndrome. In inflammatory lesions of either the chest or central nervous system, treatment of the underlying infection has shown spontaneous remission of the hyponatremia.

Treatment of the hyponatremia is accomplished best by restriction of fluids. Since all of the signs of SIADH result from excessive retention of water, reduction of fluid intake to the point where urinary and insensible losses induce a negative water balance, will lead to restoration of normal body fluid volume, a reduction in urinary sodium excretion, and an increase in serum sodium concentration. Ordinarily, restriction of fluid intake to 500-700 cc/day will result in a weight loss of 3-4 Kg. and accomplish the correction.

Attempting to correct the hyponatremia by infusion of hypertonic saline solutions has, for the most part, met with little success. Even large doses of parenteral sodium are rapidly excreted in the urine. Only in cases of severe water intoxication with hyponatremia, manifesting severe CNS symptoms of convulsions or coma, may short term benefit and reduction of symptoms be accomplished by this effort to acutely increase serum osmolality.

Very large doses of mineralcorticords may, in some cases, induce sodium retention in SIADH. However, this treatment is not recommended since it is not aimed at correction of the increased fluid volume, the true underlying problem. Only in adrenal or pituitary insufficiency, in which small doses of steroids provide replacement therapy, can the use of steroids be considered as appropriate treatment.

Some investigators have been able to lower the osmolality of the urine with ethacrynic acid, which acts on the ascending limb of the loop of Henle. However, this requires more research. Also, infusion of unreabsorbable solute (Mannitol) intravenously may increase free water excretion in congestive heart failure and cirrhoses. Whether this drug will be adopted as a measure to diminish water intoxication is questionable, but it certainly deserves further study.

Summary

I have attempted to elucidate some of the confusion that I experienced when first attempting to fathom SIADH. Though at one time a rare entity, it has become increasingly more prevalent and the list of diseases with which it is associated more lengthy. Normal renal water metabolism was discussed as were possible mechanisms of hyponatremia in SIADH. A short case history served to exemplify the cardinal features of the syndrome, namely, (1) hyponatremia with hypoosmolality and increased ECF volume plus (2) continued urinary excretion of sodium in a less than maximally dilute urine. Differentiation of this syndrome from disorders marked by dehydration or by circulatory insufficiency when edema is rarely difficult. Recommended treatment is, first, treatment of the underlying disease, and, for the water excess and hyponatremia, fluid restriction is most successful. The use of potent diuretics and osmotic diuretics deserves further investigation. •

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Inflammatory carcinoma of the breast

Peter Rosen, MD, Thermopolis, Wyo.

THIS VIRULENT FORM of breast cancer can, of course, occur in any age group. Unfortunately, it is more common in young women. Because of its rarity, there are no large personal series of cases. While many modalities of therapy have been attempted, virtually all have been unsatisfactory. Consensus at present is that radical mastectomy, conventional radiation and endocrine ablative procedures are all non-helpful and probably contraindicated. Cobalt and other high voltage radiotherapy are still relatively new innovations, and at present they are of undetermined value in the treatment of this disease. The following cases are reported to illustrate some common problems encountered in the treatment of this entity—possibly to help other physicians to a rational management.

CASE REPORTS

CASE 1: A 32-year-old white female Gravida VIII Para VIII, whose last childbirth had been two years prior to the onset of her present illness, presented to her family doctor with a 3 day history of pain and reddening of the left breast. On basis of diagnosis of breast abscess incision and drainage under general anesthesia was attempted. When no pus was encountered the breast was biopsied. Pathology revealed carcinoma invading the skin lymphatics (by definition inflammatory carcinoma). The patient was referred to our clinic. She was found to be enormously obese with a massive carcinoma of the left breast involving ⅔ of the breast with marked reddening and skin edema (peau d'orange). There was a suggestion of supraclavicular lymphadenopathy and chest x-ray revealed an infiltrate in the right middle lobe. A simple mastectomy was performed, despite the probable pulmonary metastasis, to prevent breakdown of the mass and to facilitate radio therapy. She became quite ill during her initial radiation therapy which could not be completed; and three months after her initial biopsy succumbed to her disease. X-ray prior to death revealed bilateral infiltrates. Permission for autopsy could not be obtained.

CASE 2: A 42-year-old white female was first seen complaining of tenderness and mass in the right breast. The patient stated that she had been afraid of breast cancer and examined her breasts once a week, and that the mass had appeared within the last week. She was found to have a very large mass involving the lower half of the right breast with skin edema and inflammation involving about one third of the breast. Axillary and supraclavicular nodes were not palpable and chest x-ray was negative. Clinical diagnosis was inflammatory carcinoma, and an attempt was made to confirm tissue diagnosis with a Vim Silverman needle biopsy as the patient was to be transferred for cobalt therapy. However, the pathologists were unable to commit themselves on the needle biopsy, so an open biopsy was performed which confirmed inflammatory carcinoma.. The patient was treated with cobalt with marked shrinking of the primary mass and subsequently underwent simple mastectomy. Twelve months later she died of carcinomatosis. No autopsy was performed.

Discussion

Any study of this uncommon but virulent tumor emphasizes the frequency of missed diagnosis, as with our first case, the most common confusion being that of breast abscess. It is well to remember that abscess is rare in the unpregnant or nonlactating breast while conversely inflammatory carcinoma is even rarer during pregnancy.

There has been some conflict over a common pathologic description, some authors saying there is nothing typical to this variety of carcinoma. However, consensus is that while the cell type is not constant what produces the gross characteristics of skin inflammation (reddening, enlargement, edema, pain and tenderness), is the invasion of skin lymphatics by tumor cells. It is this finding upon which the pathologic diagnosis of "inflammatory carcinoma" rests. This entity is to be distinguished from Paget's disease which is carcinomatous invasion of the

nipple, and which is amenable to conventional forms of therapy.

Another common aspect of all studies is the futility of all described forms of therapy. All modalities of mastectomy with and without radiation, before and after, combined with or replaced by endocrine ablations, have been tried, and judging by the paucity of 5-year-survivors and no known cures, all are equally futile. If this be so, what course of therapy should be followed? First of all, the surgeon must face the reality that in this particular tumor, he has nothing to offer beyond palliation. He must also accept that except for a lucky few, survival and palliation will be measured in months. It is thus incumbent upon him to utilize only those treatments which will not add to the patient's misery. Simple mastecomy is probably indicated for two reasons: first, there is actual pain associated with the skin inflammation, and secondly, each patient psychologically needs to feel that some attempt is being made to treat this frightening disease. The average hospital stay with simple mastectomy is short, and the procedure relatively painless. For those patients for whom cobalt therapy is readily obtainable preliminary radiation is preferable, and if good response to the radiation occurs (as occasionally happens) the mastectomy can be eliminated. However, the total hospital stay is at least equal, and one must accept the serious morbidity of radiation sickness which far outlasts that of surgery. All more extensive surgery, all endocrine ablations, and all cancer chemotherapy are contraindicated. All remaining palliative efforts should be directed towards the patient's maximum comfort and well being. To criticize my own two experiences, I feel that in Case 1, the cobalt therapy was futile and certainly increased this patient's discomfort, while in Case 2 simple mastectomy may well have been unnecessary. In addition, needle biopsy in this lesion was a waste of time as a small incisional biopsy is necessary for the pathologic diagnosis. The needle distorts the skin so that the lymphatic invasion cannot clearly be visualized.

Summary

Awareness of this lethal condition will assist the proper diagnosis, but once it is made, all effort must then turn to palliation of the patient, not the physician. •

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After only one year:

Administered to more people than live in Boulder, Ogden, Butte, and Santa Fe.*

Injectable
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*An estimated 208,000 patients have received GARAMYCIN Injectable to date. The combined population of Boulder, Ogden, Butte, and Santa Fe is 200,000. (Estimated 1969 figures from The New York Times Encyclopedic Almanac 1970.)

See Clinical Considerations section on last page...

Mounting acceptance in the hospital...

Proven clinical effectiveness

Respiratory Infections

Outstanding results in serious gram-negative respiratory infections[1,2]

GARAMYCIN Injectable may prove successful where other antibiotics have failed.

Urinary Tract Infections

Strikingly effective in selected urinary tract infections[3]

With relatively low intramuscular doses, the promptly attained levels of GARAMYCIN achieved in the urine are considerably higher than the concentrations required for effectiveness against virtually all susceptible gram-negative pathogens. (Appropriate precautions are indicated in patients with impaired renal function; consult Package Insert for full details.)

Septicemia

May be lifesaving[4-6]

Numerous investigators have drawn attention to the value of GARAMYCIN Injectable in the treatment of gram-negative septicemias, often complicated by shock. Many hospital strains of *Serratia* are susceptible.[6]

Wounds and Burns

Response may be dramatic in wounds and burns complicated by sepsis[7]

The established efficacy of GARAMYCIN Injectable against *Pseudomonas*—as well as most other gram-negative pathogens—makes it an especially useful agent in the treatment of infected wounds and burns.

Important Precautionary Note Patients receiving treatment with GARAMYCIN Injectable (gentamicin sulfate injection) should be under close clinical observation because of the toxicity associated with the use of the drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those with preexisting renal damage, treated with GARAMYCIN Injectable for longer periods or with higher doses than recommended.

GARAMYCIN Injectable is potentially nephrotoxic, and this should be kept in mind when it is used in patients with preexisting renal damage.

This drug should be limited to the treatment of serious infections caused by susceptible gram-negative bacteria, with due regard for relative antibiotic toxicity. (See Clinical Considerations section.)

Mounting evidence in the laboratory...

Schering

Over 95% gram-negative pathogens sensitive.*

No other antibiotic performed comparably *in vitro* against gram-negative pathogens.
In a nationwide culture audit of antibiotic sensitivity patterns, sensitivity reports from 106 hospitals, geographically representative by census tract and of varying sizes, were analyzed. During the three-month period, ***every*** gram-negative culture slip from ***every*** hospital was surveyed. The total number of cultures involved in the audit was 97,091. The total number of sensitivity determinations was 643,503.

Pathogens	Percentage of sensitive strains / Number of strains tested — Antibiotics*							
	Garamycin	Kanamycin	Cephalothin	Cephaloridine	Ampicillin	Colistimethate	Chloramphenicol	Tetracycline
Klebsiella pneumoniae	99.5% 962	84.7% 992	86.2% 995	76.1% 67	32.7% 1,020	96.3% 640	82.9% 1,028	77.1% 1,026
Aerobacter aerogenes	95.9% 2,739	86.1% 2,818	53.5% 2,985	58.8% 1,514	22.7% 3,066	88.6% 2,603	85.8% 3,071	67.8% 2,981
Klebsiella aerobacter group	98.8% 566	83.9% 547	66.1% 522	60.5% 276	28.0% 553	89.5% 560	86.2% 587	62.8% 433
Klebsiella, all others	92.7% 2,944	83.3% 3,186	77.4% 2,976	67.5% 627	13.5% 2,883	95.0% 2,105	81.6% 3,212	70.6% 3,063
Pseudomonas aeruginosa	91.6% 4,528	29.8% 4,460	6.6% 4,418	6.6% 1,279	6.0% 4,360	91.3% 3,852	26.9% 4,608	26.4% 4,404
Proteus, indole-positive	91.8% 1,031	85.8% 1,062	39.9% 981	54.1% 364	40.2% 1,042	10.3% 758	76.1% 1,096	42.1% 1,051
Proteus mirabilis, indole-negative	94.9% 3,272	90.1% 3,378	83.1% 3,290	77.5% 975	78.0% 3,274	8.8% 2,634	85.9% 3,469	26.8% 3,278
Proteus, unspecified	96.2% 1,335	85.8% 1,371	71.7% 1,434	70.0% 647	64.7% 1,435	11.2% 1,233	76.0% 1,421	22.4% 1,298
Escherichia coli and all other *Escherichias*	96.4% 12,557	91.4% 12,818	87.8% 12,686	88.8% 4,251	74.6% 12,899	95.4% 10,623	94.1% 13,086	70.0% 12,559
Paracolobactrum, all	93.4% 303	88.9% 325	62.0% 305	74.2% 62	43.8% 340	80.9% 215	87.1% 350	72.6% 340
Coliform bacteria	99.0% 593	91.2% 649	81.5% 637	66.7% 21	52.7% 624	95.6% 607	91.6% 678	76.1% 637
Totals	95.1% 30,830	80.5% 31,606	65.3% 31,229	68.1% 10,083	50.3% 31,496	75.8% 25,829	79.7% 32,606	56.5% 31,070
Gram-positive (Included for consistency with Package Insert, not an approved indication)								
Staph—*S. aureus,* coagulase-positive	97.4% 1,548	88.8% 1,458	97.7% 2,050	98.7% 636	61.1% 1,559	20.4% 628	94.4% 2,123	83.7% 1,966
Staph—*S. aureus,* unspecified	99.3% 993	92.8% 902	98.1% 1,289	95.3% 213	45.8% 1,153	29.3% 116	96.4% 1,427	82.3% 1,360

*Adapted from a three-month, nationwide hospital audit by R. A. Gosselin and Co., Inc., Dedham, Massachusetts (mid-May to mid-August,1969).[5]
Antibiotics with significant gram-negative spectra are included. Organisms are listed as reported by laboratory.
Sensitivity testing was done by the disc method, a generally reliable test in the hospital setting. It should be noted, however, that the results with GARAMYCIN were somewhat higher than the results reported where the tube dilution technique was used. (See Clinical Considerations section which follows.) The concentration of the GARAMYCIN disc was 10 mcg.
Whereas standard testing methods were used by all hospitals, it is acknowledged that in a survey of this kind considerations such as differences in methodology are possible sources of error. The comparative percentage-sensitivity results derived from a survey of this kind are, therefore, not absolute. One should keep in mind also that the proper selection of an antibiotic is based not only on susceptibility testing but on relative toxicity and other clinical considerations as well.
It is felt, nonetheless, that the broad scope of the survey and the extreme care in data collection and tabulation permit a conclusion that the results are *generally* representative of current nationwide antibiotic sensitivity patterns.

Injectable Garamycin®
brand of gentamicin sulfate injection

See Clinical Considerations section on last page...

Injectable Garamycin® brand of gentamicin sulfate injection

ADULT DOSAGE GUIDELINES

See definitive prescribing information in Package Insert.

Patients with Normal Renal Function

Total Daily Dose (administered in two, three, or four divided doses)			
Urinary Tract Infections (due to susceptible strains of gram-negative bacteria)†	Less Severe 0.8-1.2 mg./kg. for 7-10 days	Resistant/ Moderately Severe Larger doses or additional antibacterial therapy should be considered in severe urinary tract infections or in resistant cases involving the renal parenchyma or anatomic anomaly.	Serious/Life-Threatening up to 5 mg./kg.
Other Infections including bacteremia, infected surgical wounds, severe soft tissue infections, and respiratory tract infections (due to susceptible strains of gram-negative bacteria)	3 mg./kg. for 7-10 days		

†Alkalinization of the urine may be a useful therapeutic adjunct.

Patients with Impaired Renal Function

To minimize the risk of ototoxicity in patients with impaired kidney function, only the first dose should be that normally recommended. Each subsequent dose should be half or less of that recommended for patients with normal renal function, depending upon the degree of renal impairment.

In patients with renal failure who are undergoing 14-hour hemodialysis twice weekly, administration of 1 mg./kg. GARAMYCIN Injectable at the end of each dialysis period has been suggested.

Clinical Considerations

Indications: GARAMYCIN Injectable is clinically effective in infections due to susceptible strains of gram-negative bacteria, including *Pseudomonas aeruginosa*, and species of indole-positive and indole-negative *Proteus*, *Escherichia coli*, and *Klebsiella-Aerobacter*. Bacteriologic studies should be conducted to identify the causative organism and to determine its sensitivity to gentamicin sulfate. Sensitivity discs of the drug are available for this purpose. If the susceptibility tests indicate that the causative organism is resistant to gentamicin sulfate, other appropriate antibiotic therapy should be instituted.

IN VITRO INHIBITION OF CLINICALLY IMPORTANT BACTERIA BY GENTAMICIN SULFATE (TUBE DILUTION STUDIES)

BACTERIA	No. of Strains Tested	No. of Strains (%) Inhibited by: 4 mcg./cc. or less		8 mcg./cc. or less*		No. of *In Vitro* Studies
Staphylococcus aureus	1,210	1,200	(99%)	1,206	(99%)	11
Pseudomonas aeruginosa	885	771	(87%)	828	(93%)	16
Escherichia coli	836	736	(88%)	779	(93%)	11
Indole-positive and indole-negative *Proteus* species	477	210	(44%)	358	(75%)	12
Klebsiella-Aerobacter species	292	205	(70%)	231	(79%)	10

*Number of strains (%) of gram-negative bacteria inhibited by 10 mcg./cc. or less are as follows: *Pseudomonas aeruginosa*, 828 (93%); *Escherichia coli*, 792 (95%); *Proteus* species, 393 (82%); *Klebsiella-Aerobacter* species, 284 (97%). From same studies as above.
Source: Package Insert

This drug should be limited to the treatment of serious infections caused by gram-negative bacteria, particularly *Pseudomonas aeruginosa*, *Proteus* and other susceptible organisms, with due regard for relative antibiotic toxicity. Therefore, the drug should be considered for use against gram-negative: 1. Bacteremia; 2. Infected surgical wounds; 3. Severe soft tissue infections, including burns complicated by sepsis; 4. Respiratory tract infections; and 5. Selected cases of urinary tract infection.

Contraindications: GARAMYCIN Injectable is contraindicated in individuals with a history of hypersensitivity or toxic reactions to gentamicin.

Warnings: Patients receiving treatment with GARAMYCIN should be under close clinical observation because of the toxicity associated with the use of this drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those wi pre-existing renal damage, treated with GARAMYCIN Injectab usually for longer periods or with higher doses than recommende

GARAMYCIN Injectable is potentially nephrotoxic, and th should be kept in mind when it is used in patients with pre-existir renal impairment. Kidney function diminished by infection of th upper urinary tract may, however, improve during effective trea ment with GARAMYCIN Injectable.

Concurrent administration of potentially ototoxic drugs such streptomycin and kanamycin or of potentially nephrotoxic dru such as polymyxin, colistin, and kanamycin with gentamicin sulfa has not been shown to afford any clinical advantages and, moreov may result in additive toxicity. Monitoring of vestibular, cochlea and renal function will provide guidance for therapy in such case

Precautions: In patients with impaired renal function in who serious infection develops, serum concentrations of the drug ma rise, with consequently increased risk of ototoxicity. In these pa tients or in those in whom recommended dosage or duration c therapy must be exceeded as a life-saving measure, routine studi of kidney function should be performed when possible. These ma be supplemented by evaluation of the vestibular and auditory func tion and measurement of serum concentration of the drug whe feasible. Serum concentrations of gentamicin should be maintaine below the range of 10-12 mcg./ml. to reduce risk of ototoxicity.

Ordinarily, treatment should not be given for more than 7 to 1 days or be repeated unless required for serious infection not r sponsive to other agents.

As with other antibiotics, treatment with GARAMYCIN Injectabl may occasionally result in overgrowth of nonsensitive organisms. I superinfection occurs, appropriate therapy is indicated.

Safety for use in pregnancy or the potential for fetal ototoxicity o nephrotoxicity have not been established. Studies in pregnant ani mals have not revealed teratogenic or ototoxic effects in the fetus GARAMYCIN Injectable should not be used in pregnant patients o in women of childbearing age unless its use is deemed advisabl by the physician.

Adverse Reactions: The overall incidence of ototoxicity considere related to treatment with GARAMYCIN Injectable was 2.8 per cen (16 of 565 patients). Contributory factors (two or more factors were relevant to most patients) were as follows: 10 had azotemia, 1 received a total of 1 gram or more of the drug, 7 had recently re ceived other potentially ototoxic antibiotics (streptomycin or kana mycin), and 5 were over 60 years of age. Six also had decrease high-tone hearing acuity, which returned to or toward normal i the 4 patients retested.

Analysis of BUN data indicated that 4 (2%) of 172 patients showe increases in BUN that were probably related to treatment wit GARAMYCIN Injectable. Of 20 increases probably or possibly relate to treatment, 7 were reversible, 9 occurred in terminal patients, and 4 had no follow-up.

Other adverse reactions associated with treatment were one instanc each of urticaria, decreased hematocrit, and reversible depression of granulocytes with normal bone marrow. Other rarely reported and possibly treatment-related adverse reactions were anemia, in creased reticulocyte count, rash, purpura, drug fever, hypotension convulsions, twitching, salivation, nausea, vomiting, increased trans aminase activity (SGOT or SGPT), increased serum bilirubin, de creased serum calcium, and joint pain.

Packaging: GARAMYCIN Injectable, 40 mg./cc., 2-cc. multiple-dos vials, for intramuscular administration.

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*Dosage in this investigational study was less than now recommended in Package Insert.

For more complete prescribing details, consult package insert or Physicians' Desk Reference. Schering literature is also available from your Schering Representative or Medical Services Department, Schering Corporation, Union, New Jersey 07083.

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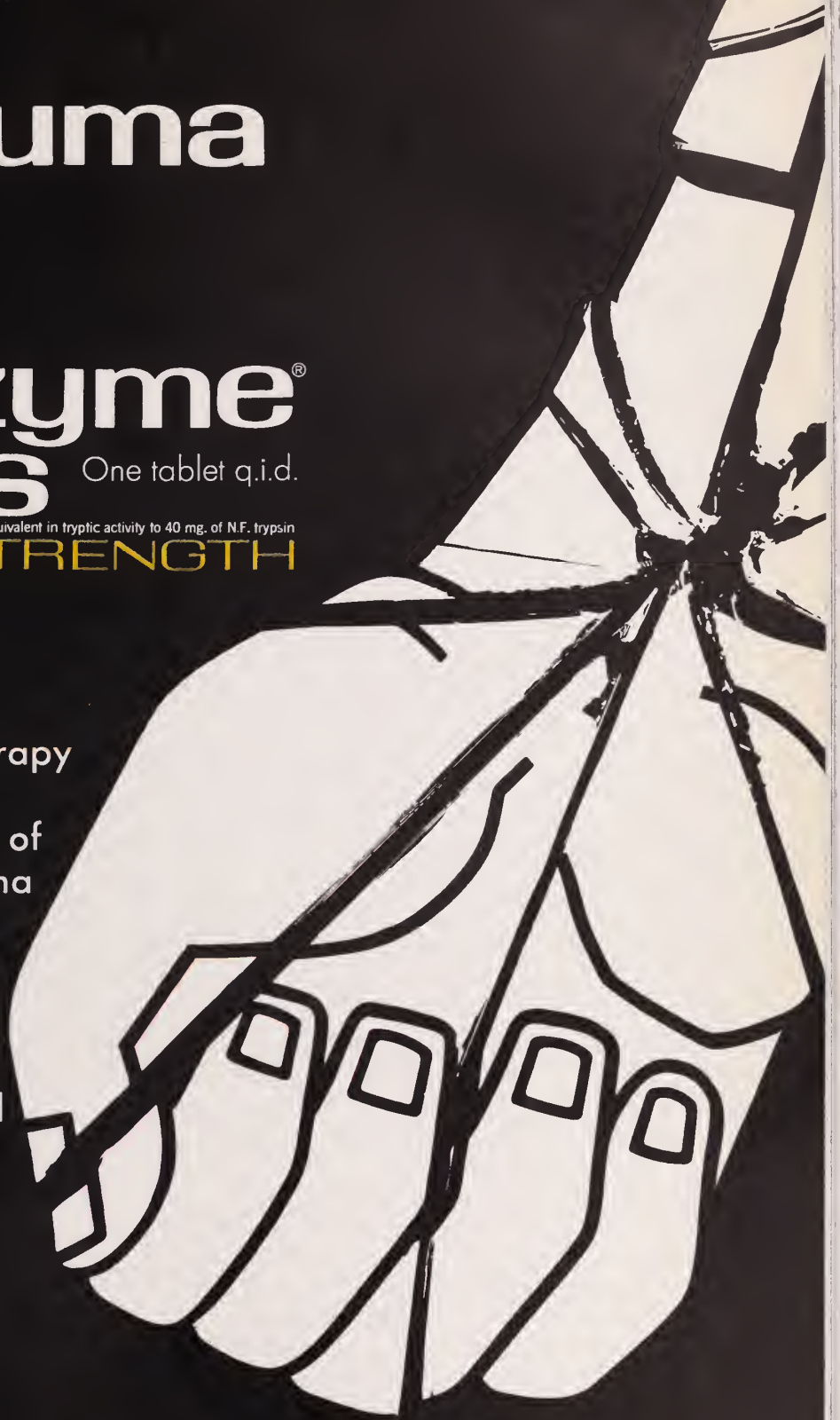

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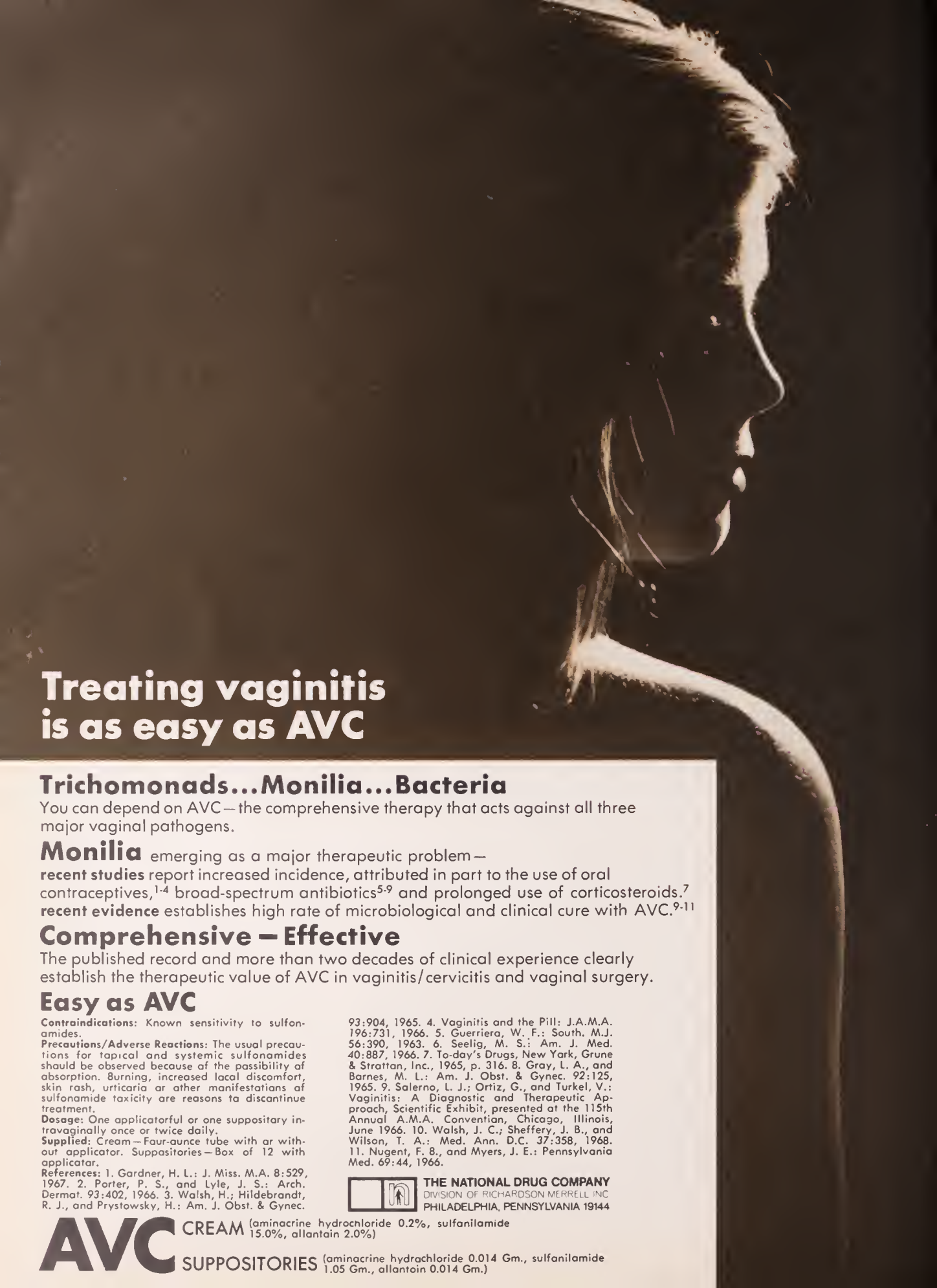

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Cryotherapy of the cervix*

G. R. Cheatham, Jr., MD, Casper, Wyoming

A simple effective treatment for persistent chronic cervicitis. An anatomical change in the post-treatment cervix is noted which has not been commented on before.

CHRONIC CERVICITIS is indeed a mundane subject in these days of organ transplantation, the artificial kidney and the intensive care unit. However, the condition is still with us. Chronic inflammation and irritation have been cited as associated factors in cervical cancer as well as in other areas of the human body. Therefore, it behooves us to continue to seek optimal treatment modalities for our patients with this condition.

For more than 60 years chronic cervicitis has been treated by electrocauterization with varying degrees of success or failure. Some of these figures have been reviewed recently[6] and the usual cure rates vary from 68 to 76 per cent by using 2 to 4 treatments for the average patient. I am sure that anyone who has used the usual nasal tip electrocautery for cervicitis has experienced the frustration of excessive bleeding during the treatment and the seemingly fruitless efforts to control it. The patient discomfort during treatment sometimes dictates a plan of serial treatment of portions of the cervix over a period of several months. The post-treatment complaint of a malodorous vaginal discharge is frequent enough to be upsetting. And who has not made an occasional visit to the emergency room to control frank hemorrhage following an extensive cautery?

In 1963, Cooper described cryotherapy and its use in treatment of diseases of the central nervous system, including malignancies.[3] He discussed the biologic effects of rapid, intense freezing and enumerated five mechanisms of tissue destruction. In 1964, Cahan reported the experimental use of extreme cold in three gynecologic cases.[1] Several of his observations are basic to the use of this modality in the human uterus and have been verified by others.[2,4,5] Among these are the very sharp line of demarcation between the treated tissues and the surrounding normal tissues, intracapillary thrombus formation in the adjacent normal tissue, re-epithelialization by the adjacent epithelium, and the extreme predictability of these effects. Recently cryotherapy has been compared to electrocautery in the same patient,[6] and its use has been documented in preoperative treatment of early cervical malignancy.[4] Relatively long term follow-up has failed to reveal any deleterious effects on the human cervix.[7]

Method

Bearing these facts in mind one year ago, I began treating persistent chronic cervicitis with cryotherapy. The Hill Cryosurgical unit† was used in all instances. This unit uses liquid Freon to obtain probe temperatures of —50 to —60° Centigrade. A silver coated, cone shaped probe measuring 2.0cm. in diameter at its base and 1.5cm. along the axis was used in all cases. The temperature of the probe is monitored by a thermocouple at the flat base of the probe. The temperature is

*Presented at the Mid-Winter Seminar of the Wyoming State Medical Society, March 25-28, 1970, Cheyenne, Wyoming.

†Frigitronics, Incorporated—Bridgeport, Connecticut.

held below —40° Centigrade for three minutes for a standard treatment.

The probe is placed snugly against the cervix with its point extending into the lower portion of the endocervical canal. No other instruments are applied to the cervix. As cooling begins, the probe is fixed to the surface tissues when the tissue moisture is converted to ice. As freezing proceeds an ice ball forms and extends out from the probe onto the surface epithelium. All of the affected area is included in this ice ball. Thawing to detach the probe is also rapid. A system of ports passes relatively warm liquid Freon through the probe, thus raising the probe temperature enough to free it.

Immediately after the treatment the cervix is very hard in consistency and the central area has the appearance of the cervix immediately after cold knife conization. There is a funnel shaped defect identical to the shape of the probe. The tissue is a pale pink to white in color. As the cervix thaws the patient begins to experience a watery discharge. This continues and is excessive for a span of 1-2 weeks, after which it gradually diminishes and becomes more viscous. This discharge usually ceases 3 to 4 weeks after treatment.

All patients had a preliminary evaluation including normal cytologic studies. Local treatment with various vaginal medications was prescribed and only patients returning with persistent inflammation and/or eversion were treated. To date 123 patients have been treated. Fourteen patients have been treated in the past eight weeks and none of these is included in the follow-up visits. Of the remaining 109 patients, 77 have been seen one or more times at intervals of 4 weeks to 12 months.

Early in the series, I retreated two patients four weeks after the initial treatment. I think a longer interval is necessary before trying to assess the end point of healing. Currently I think this interval should be eight weeks. Two more patients were retreated for persistent spotting within the first three weeks after initial therapy. Four patients were retreated for persistent disease 6 or more weeks after the initial therapy. None have needed more than two treatments. There have been no other complications.

No analgesia or anesthesia was used in this series. All treatments were on an outpatient basis. No patient experienced pain severe enough to discontinue treatment. Most had mild cramping during the treatment. They describe this "like menstrual cramps." A few described this "like early labor." I could not predict which patients would have pain. Many stated the vaginal speculum was the most uncomfortable aspect of the treatment. A few reported persistent mild cramping in the few hours after treatment. Again, there was no way to predict this; some who had experienced the more severe cramps during therapy were completely comfortable once the instrument was removed.

One patient was treated in early pregnancy with no deleterious effects on her subsequent labor or the foetus. Two others have since conceived. One passed a blighted ovum. The other continues an uneventful pregnancy.

Results

The late post treatment appearance of the cervix is striking and rather consistent. Large obstetrical lacerations are much smaller and many smaller lacerations disappear completely. Most cervices assume the anatomy of a nulliparous cervix with the squamocolumnar junction apparently inside the endocervical canal, although none have been examined with the culposcope. In a few instances the redness persists in small areas even though epithelialization appears grossly completed. Large, deeply seated Nabothian cysts have been exposed by the treatment and have subsequently sloughed, seemingly making the cervix smaller.

I have found no cervical stenosis.

The amount of cervical mucus is much diminished and is clear in most instances. Indeed, I have been impressed by the favorable voluntary comments of many patients, most to the effect that they are now more comfortable day in and day out and that they had taken the presence of leukorrea for granted until they noted its absence.

There are several benefits to the patient in using this form of treatment. I have placed no limitations on coital activity post-operatively, and have found none necessary. There

is no malodorous vaginal discharge. The minimal incidence of any post-operative bleeding and absence of hemorrhage speak for themselves. The high incidence of good primary healing without repeated office visits benefits both patient and physician. The comfortableness during and after treatment without analgesia or anesthesia are remarkable considering the volume of tissue treated. I too have noted no deleterious effects, although another year or so will be necessary to completely evaluate this.

The improved anatomy of the cervix deserves special comment. It seems very reasonable to assume that the treated cervix with its more nulliparous appearance, absence of Nabothian cysts and fissures would offer much less chance of harboring a low grade infection of any sort. I think this overall appearance with little or none of the more vulnerable columnar epithelium exposed to the more hostile vaginal environment is significant. Perhaps the repeated observations of the patients concerning the absence of leukorrhea is testimony to the lack of cervicitis. Certainly the appearance supports this line of thought.

Summary

I agree with others that cryotherapy of the cervix offers distinct advantages over electrocauterization for the treatment of persistent chronic cervicitis. An anatomical improvement is apparently inherent in the use of the cone shaped probe. In the future this may turn out to be the most significant change. Cryotherapy certainly deserves further trial and study. •

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Volvulus of the cecum*

Ross J. Collie, MD, Lander, Wyo.

An acute abdominal problem accurately and readily verified by x-ray examination and easily and satsfactorily managed if treated early.

VOLVULUS IS THE TERM used to describe a process in which a torsion or twisting of a segment of bowel results in an obstruction to the lumen and a disturbance in the circulation to the wall of the intestine.

Rokitansky, in 1841, was the first to describe cecal volvulus. Many reported series of cases have been in the surgical literature. Radiological publications on cecal volvulus have been few up to 1943, but thereafter, have increased in appearance in the literature because x-ray examination is the only means by which a definitive diagnosis may be made preoperatively.

Incidence

As a cause of bowel obstruction, cecal volvulus ranges from one to fifteen per cent. It is estimated to be as high as seventeen per cent (17%) of all intestinal obstructions in European, and in particular in the Scandinavian, countries. In the United States, the incidence is less than half of that reported in the European countries. Such differences account for the greater appearance of this entity in the European literature. Frimann-Dahl suggests that there may be a relationship to the higher incidence in the Scandinavian countries due to the diet. The coarse, heavy consistency of the food is considered to create gaseous distention and to contribute to bringing about torsion and twisting of the colon.

The mortality rate is astoundingly high. In Chalfant's series of 119 cases, 96 were operated with a 59 per cent mortality, and 23 of the non-operated with a 100 per cent mortality. This yielded an over-all mortality rate of 67 per cent.

Pathogenesis

Abnormalities of rotation, descent, or fixation of the cecum are necessary prerequisites for the formation of this entity. The process of rotation, starting in the second to the third fetal month and being completed in the eighth month, carries the originally left-sided ascending colon across the abdomen. Descent occurring in this process allows the cecum to sink from a subhepatic to a right iliac fossa location. Fixation is the process where the right mesocolon is lost and the right colon is made adherent to the posterior abdominal wall. The fixation process continues from the eighth fetal month to the fourth month after birth and this determines the degree of mobility of the cecum and the ascending colon.

The most common anatomical arrangement is believed to be one in which the cecum is free and the ascending colon is fixed somewhere along its vertical course. A few cases of bands, which bind down the ascending colon, have been reported. In any event, the mechanism appears to be dependent upon a fixed point or points about which twisting can occur. It is interesting to note that ten to fifteen per cent of normal adult cadavers demonstrate a cecum which is mobile enough to allow the development of a volvulus.

The underlying predisposing causes are embryological, however, an inciting etiology precipitates its occurrence. The knowledge about inciting factors is minimal, but most seem to be of a mechanical nature. Most

*Presented at the Wyoming State Medical Society Mid-Winter Conference, Cheyenne, Wyoming, March 26-28, 1970.

cases seem to occur following traumatic events such as exercise, heavy lifting, blows to the abdomen, coughing, jumping and dancing. Several cases of cecal volvulus have occurred during pregnancy.

Cecal volvulus has been classified into different types. Faltin described two types. One is the sack type in which the colon is twisted in an axial or vertical fashion. The other type is the loop type in which part of the ileum is twisted with the cecum. Courty described three types according to the anatomic structures involved in the volvulus. They are ceco-colic, ileo-ceco-colic, and axial torsion.

CASE REPORTS

Case 1: A ten-year-old Indian boy was admitted to hospital on 4/25/69, having awoke at 3:00 A.M. that morning complaining of nausea, vomiting, diarrhea, and crampy periumbilical abdominal pain. The patient had had no previous surgery, and there was no history of recent injury to the abdomen.

Physical examination revealed right upper quadrant tenderness, no rebound tenderness, and hypoactive bowel sounds.

Roentgenograms of the abdomen on the day of admission (Fig. 1a) revealed the cecum to be dilated and to be displaced to the right upper quadrant. The ileocecal valve was directed laterally. Subsequent abdominal x-rays on the following morning (Fig. 1b) showed dilated small bowel proximal to the displaced, dilated cecum. A diagnosis of cecal volvulus with complete obstruction was made by x-ray.

At surgery, the cecum had twisted 180° from its normal right iliac fossa location. The distal two-thirds of the ascending colon was not fixed retroperitoneally. After the lateral peritoneal reflexion was excised, the cecum and the ascending colon were mobilized and returned to the right iliac fossa location. An incidental appendectomy was done.

Postoperative abdomen x-rays showed gas in the transverse and descending colon with no evidence of bowel obstruction. The patient was discharged on May 3, 1969.

Case 2: A 74-year-old white male was admitted to hospital on Dec. 26, 1969. Several days prior to admission the patient complained of increasing, colicky-type abdominal pain which he attributed to a considerable amount of drinking of alcohol. On the day of admission the pain was more constant with a considerable amount of vomiting. There was no hematemesis or melena, and normal bowel movements were reported.

One week prior to this admission, the patient had sustained a fall causing multiple lacerations to the face and hands. He was admitted to hospital at that time in an intoxicated condition. A normal abdominal physical examination was reported at that time, and the patient signed himself out of the hospital against medical advice.

On previous earlier admissions, the patient

Fig. 1-a. The initial scout film of the abdomen of case 1 clearly shows the displaced dilated cecum (twisted 180°) to be in the subhepatic region. Note that the ileocecal valve is directed laterally.

Fig. 1-b. The 12-hour AP and upright abdomen of case 1 now show marked dilation of small bowel loops up to the mid jejunum.

Fig. 2-a. The AP abdomen of case 2 shows the large dilated cecum in the L.U.Q. (twisted 360°). Note that there is very little gas or stool in the transverse and left colon.

Fig. 2-b. The upright abdomen shows a large, long air-fluid level. A second fluid level is also present, but is not visualized on this film. The presence of two fluid levels is common in the loop type of cecal volvulus.

admitted to having frank bloody stools. The landlady at his hotel reported that there was a continuous streak of blood back and forth from the bathroom to the bedroom, and that his clothing and bedding had frequently been saturated with blood. A previous upper GI series in 1967 did not demonstrate any ulcerative disease. Previous surgery consisted of an appendectomy, cataract removal from the right eye, and a recent right intertrochanteric fracture in 1969.

The laboratory findings were normal except for an increased white count which was 15,000, having a shift to the left. Hematocrit was normal.

The patient's hospital clinical course was one of increased abdominal distention from his admission early in the morning to the evening of the same day. During this time a nasogastric suction tube produced 700 cc. of fluid which strongly suggested the clinical diagnosis of an obstructing duodenal ulcer. The abdominal series film revealed a dilated viscus occupying the mid and left upper abdomen (Figs. 2-a and 2-b). A radiographic diagnosis of cecal volvulus was made. A barium swallow, to prove that the distended viscus was not stomach, outlined an undilated stomach (Fig. 2-c).

At surgery, a large dilated cecum which had twisted 360° was found in the mid and left upper quadrant of the abdomen. The bowel was not gangrenous. The volvulus was released and the cecum was decompressed through a cecostomy which was immediately closed. Two-thirds of the ascending colon was fixed retroperitoneally and the cecum was freely mobile.

On the third postoperative day, the patient had early congestive heart failure, was treated, and the subsequent postoperative course was uneventful. He was placed on an ulcer diet and was discharged on Jan. 10, 1970.

Clinical Diagnosis

An analysis of the signs and symptoms from some of the reported series follows. Percentages are from 100 cases summarized from Donhauser and Atwell.

1. Age—Cecal volvulus occurs in all age groups, with a peak incidence from 20 to 40 years.

Fig. 2-c. A barium swallow readily shows that the dilated viscus is not the stomach, and confirms the original impression of cecal volvulus. Note, however, that a barium enema is the most decisive diagnostic procedure.

2. Sex—There is no predominance in either sex.

3. Previous History—Almost 75 per cent of cases give a past history of mild to severe indigestion. Practically all patients give a previous history of constipation to some degree.

4. Previous Operations—Slightly less than 25 per cent of patients had previous surgery.

5. Pregnancy—In 10 per cent of cases, the obstruction accompanied pregnancy.

6. Distention, Nausea, and Vomiting—Practically all patients who gave a complete history had these symptoms.

7. Rigidity — This is an inconstant abdominal sign.

8. Visible Peristalsis—This is an inconstant physical sign.

9. Masses—Approximately 25 per cent of cases demonstrated a palpable abdominal mass and the location was somewhat variable.

10. Pain—All patients complained of abdominal pain. The type of pain was variable, but initially appeared to be intermittent and colicky, and later was continuous and severe.

11. Shock—Approximately 25 per cent of the patients experienced shock.

12. Duration of symptoms—The duration varied from a few hours to a few days.

13. Gangrene—Approximately 25 per cent of patients had a gangrenous cecum, either at operation or at necrospy.

Roentgen Diagnosis

Figiel and Figiel have given one of the most complete explanations of the roentgen findings in torsion of the cecum and ascending colon. They have classified the obstruction caused by the volvulus under complete or incomplete, depending upon the degree of fecal content distal to the point of torsion.

Basically the demonstration of a distended cecum is essential. This may be found in any location in the abdomen, but is most often seen in the epigastrium and the left upper quadrant. Fluid levels are usually seen in the dilated cecum. If there is a simple axial twisting, a single long fluid level is usually found. If the torsion is of the loop type, two fluid levels are usually found. A small bowel obstruction is normally seen with the signs of occlusion and retention of gas and fluid within the dilated small bowel loops. A barium enema will show tapering at the end of the barium column at the location of the twisted loop. A barium meal will demonstrate the dilated, air-containing cecum adjacent to the barium-filled stomach and duodenum.

Differential Diagnosis

The differential consists of diagnostic problems which result in large dilated viscera within the abdomen. These can include the following:

1. Distended Stomach: An obstructed stomach due to a duodenal ulcer, antral gastritis, or a mass lesion at the distal end of the stomach, can result in a very large, distended,

air and fluid-containing structure. Nasal gastric suction will usually yield a large amount of gastric contents, and an upper gastrointestinal tract series can differentiate between the two conditions.

2. Organo-axial Volvulus of the Stomach: In this rare condition, the patient clinically presents with an acute upper abdominal pain and the inability to vomit. Efforts to pass a nasal gastric suction tube are unsuccessful. Radiologically a nasogastric suction tube will normally coil in the lower esophagus. The dilated stomach in organo-axial volvulus has a smooth convex border and two fluid levels are usually seen in the upright projection. Contrast studies will show a beak-like obstruction at the esophago-gastric junction.

3. Sigmoid Volvulus: A sigmoid volvulus can be differentiated easily from a cecal volvulus by means of a barium enema. On the plain films a sigmoid volvulus has a characteristic appearance of a closed loop of bowel in which the walls converge or may be followed into the left iliac fossa region. A left-sided cecal volvulus does not have such a closed loop appearance, but rather, the twisted cecum may resemble the shape of a kidney in which the torqued mesentery mimics the kidney pelvis.

4. Distended Colon: Distension of the colon could be due to a left colon lesion or a paralytic ileus. In the case of a stenonic left colon lesion, the cecum can be enormously dilated. Gas, however, is present in the colon down toward the stenonic area. A barium enema can readily confirm the presence of a left colon lesion. In the case of paralytic ileus, both large and small bowel gas is seen and this very seldom presents any radiological differential diagnostic problems.

5. Other Rare Causes: Rare diagnostic entities would include a transverse colon volvulus, large intraabdominal and occasional retroperitoneal abscess, large blind intestinal loops from lateral anastomosis of small to large bowel, and reduplication of the colon. The barium enema is the most useful diagnostic study to arrive at most of these diagnoses.

Summary

The mortality rate in cecal volvulus is greater than 50 per cent. Two cases are presented in which a definitive, preoperative diagnosis was made by x-ray. •

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Transvenous pacemakers in a small community hospital

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This paper presents a review of types of pacers, indications for pacing, patient experience at our hospital by one operator, technic, and complications.

Electrical stimulation of the heart was attempted many years ago. Implantable pacers with direct placement of electrodes into the myocardium were the first major development in cardiac pacing. Because of the problems inherent with thorocotomy in high risk patients and because of infections and wire fractures, this type of pacer left much to be desired. In 1962 the first workable transvenous electrode was employed together with an implantable power source.[1] Since then there have been many improvements in the system and in 1968 there were 28,000 pacemakers of various types in use.[2] Mechanically and electronically these units are reliable and practical. Electronic reliability, and miniaturization have been a great help in reaching our present status. In 1968 patients were reported surviving up to 78 months, and by this time there undoubtedly are patients with longer survival rates.

Types of Pacers

There are two categories of pacemakers (1) temporary and (2) permanent. The temporary pacer is mentioned only because of its ancillary use in aiding in placement of the permanent pacer and is not otherwise of concern.

Permanent pacers are of three types. The synchronous pacer is ideally the most desirable. This mechanism has the important disadvantage of being less reliable than the other types. It also involves thoracotomy for placement. Its chief advantage is that it can increase cardiac output by increasing heart rate when demanded by exercise.[3] The author has no personal experience with this type of pacemaker. The rate at which a synchronous pacer works is determined by the spontaneous atrial rate. P waves are detected by the device which then trigger the device to stimulate the ventricle after a controllable delay approximating the physiological P-R intervals. This device also blocks impulses coming too quickly from the atrium and can also generate impulses on its own should atrial activity cease.

The fixed rate pacer is what the name implies, that is, it stimulates the heart to beat from a ventricular stimulus at a fixed rate. The chief drawback with this type of pacing is that the pacemaker may fire the stimulus at the so-called vulnerable phase. This occurs in the event that AV conduction resumes. A parasystole may arise and a stimulus in this phase can cause a ventricular tachyarrhythmia. Some unexplained deaths with pacemakers of this type may have been due to the ventricular tachyarrhythmia. This device, except in very rare instances, is now obsolete.

A device which is a compromise between the fixed rate pacer and the synchronous

pacer is the demand pacer. The advantage over the synchronous pacer is that it can be inserted without thorocotomy, under local anesthesia. It will not fire on stimulus from the atrium but fires when the ventricular rate falls below a predetermined, pre-set rate. The stimulus is triggered by the QRS and is delivered in the absolute refractory phase and no danger of a ventricular tachyarrhythmia is present. Thus the demand is met when the spontaneous rate falls below the pre-set rate of the pacemaker. This is the device that we have been using since it has been available and the one with which this report is chiefly concerned.

Indications

The indications for cardiac pacing are many. However, the indication in the great majority of patients is some type of A-V block. One large series reported 80 per cent of their cases were for A-V block problems. Our own seven cases have all been for heart block. Here is a brief listing of indications in which artificial pacing of some type has been used:

1. Advanced or complete A-V block with resulting Stokes Adams attacks.
2. Chronic circulatory failure in which drug therapy fails or is inadequate.
3. Sinus node depression or sino-atrial block.
4. Recurrent tachyarrhythmia of the ventrical.[4]
5. Postoperative valvular heart surgery.
6. A-V block in familial hemochromatosis.[5]
7. Myocardial infarction.

The principle of pacing is to increase the cardiac output through an increased cardiac rate. Thus the Stokes Adams attacks are precipitated by drop in cardiac output through decreased rate. Likewise the chronically slow heart may lead to chronic congestive failure. Hemodynamic studies have shown that increasing the cardiac rate from the range of 30-40 beats per minute to 60-80 beats per minute increases the cardiac output 50-80 per cent.[6] This is particularly true with the exercising heart. Gobel[7] studied nine patients by right and left heart catheterizations who had A-V block before and after pacing. He found the exercise output was greater and the patient tolerated the exercise easier after pacing. During pacing there is a reduction in the PA wedge, right atrial and left and right ventricular filling pressures. The mean rate of ejection, stroke volume and stroke work decreased following pacing, whereas the ejection time per minute increased and dye curves assumed a more normal configuration. There was little change noted in the resting cardiac output.

Temporary pacing following a myocardial infarction is helpful in many instances. The problems that may arise from the infarcted heart that may be helped by pacing are: sinus arrest; ventricular multifocal contractions; ventricular asystole, tachycardia or fibrillation; intermittent heart block; and digitalis toxicity.

Advanced and/or complete A-V block accompanies infarction in about 5 per cent of cases. An anterior and or inferior infarction is most prone to develop blocks. McNally[8] states there is a 75 per cent mortality in anterior infarction with A-V block and a 20 per cent mortality in patients with anterior infarct without A-V block. He feels that patients with anterior infarcts with blocks should have a temporary pacer placed. Patients with pre-existing bundle branch block when they get infarcts are quite prone to develop A-V block. A word of caution, however, is that there is an increased risk of causing a tachyarrhythmia while inserting a pacemaker during an acute infarction and proper preparations must be made to handle this situation.

Experience

In our community hospital we have treated seven patients with transvenous pacemakers. Case reports follow.

CASE REPORTS

CASE 1. A 71-year-old white male retired dentist was admitted to the hospital with syncopal episodes and was found to have heart block with Stokes Adams syndrome. Additional problems were brittle diabetes, uremia, previous history of myocardial infarction and CVA. A temporary transvenous pacemaker was employed with the electrode passed through the right antecubital

vein. On 8-12-67 he was taken to the radiology department where under direct fluoroscopic visualization and local anesthesia a permanent pacemaker was inserted. The electrode was placed in the right internal jugular vein after an unsuccessful attempt to pass it through the right cephalic and right external jugular. He did well for a period of weeks when he had skin necrosis over the electrode wire in the supraclavicular area. Several attempts were made to correct this situation, including swinging skin and muscle flaps and burying the pacer beneath the pectoral muscles. Pacer extrusion became a problem that seemed insoluble. Because of his diabetes, uremia and extremely thin musculature, it was decided to remove the pacer to an external position and this was done 9/68. The patient's course was one of steady deterioration with subsequent strokes. In November, 1968 his pacer ceased functioning and he reverted to a very slow ventricular rate. Because of his many other problems it was elected by his family and his primary physician not to attempt re-establishment of cardiac pacing and he expired 11/68 of his multiple diseases with the exact cause of death undetermined.

CASE 2: A 61-year-old white female was admitted to the hospital on 9-28-67 with a diagnosis of pacemaker failure. Ten weeks prior to this admission she had undergone pacemaker implantation in Denver with the electrode placed through the right cephalic vein. She had a temporary pacemaker inserted and was taken to the x-ray department to reimplant a pacemaker. X-rays of the chest revealed the electrode to no longer be in the ideal position in the tip of the right ventricle. It was felt the failure problem was one of poor electrode contact. When the electrode was exposed, attempts at removal were unsuccessful. The electrode was firmly adhered to the heart in some manner. It was felt that it was too dangerous to persist in attempting to remove the electrode without the benefit of a standby pump for cardiotomy. She was taken to Denver with the temporary pacer working where she underwent thoracotomy at which time the electrode was found to have perforated the right ventricle. It was removed and a new electrode placed. Following this she did well and has subsequently undergone the placement of another pacer because of decreased battery life 9/69.

CASE 3: An 80-year-old white female was admitted to the hospital 10-13-67 because of heart block. A demand pacer was implanted on the left side through the left internal jugular. This patient had had a right radical mastectomy some years previously for carcinoma of the breast. She did well following the implantation until 8-23-69 when she experienced pacing failure. X-ray studies revealed some withdrawal from the previous ideal right ventricular tip position. She was taken to the X-ray unit for manipulation of the electrode and a new pacer unit placement. After exposing the electrode and attempting to manipulate it, there was a cardiac arrest which was resuscitated by external massage. The electrodes were severed from the pacer unit and conected to a temporary pacer. After the situation was under control a new electrode was placed in the right internal jugular vein and the electrode tunneled to the pocket for the pacer in the left subclavian position. She has done well since then with the exception of incurring a fracture of her hip and a sucessful hip nailing.

CASE 4: A 76-year-old white female was admitted to the hospital because of heart block. On 4/68 she underwent implantation of a demand pacer. Anesthesia was general and during induction she had a fibrillation that required defibrillation. Arrhythmia continued to be a problem and intravenous Lidocaine was given and the arrhythmia was controlled. The catheter was placed in the left external jugular because of the small size of the cephalic vein. She subsequently did well and has had no complications.

CASE 5: A 68-year-old white male was admitted to the hospital on 11-26-68 with a heart block and syncopal attacks on any exertion. He had a demand pacer placed with general anesthesia with the pacing unit placed subcutaneously. The electrode was placed through the left cephalic vein. The procedure was uncomplicated. Because of persistent bleeding from the wound, he was taken back to surgery on the first postoperative day and the wound re-explored and hemostasis obtained. He did well following this until 9-5-59 when he developed skin erosion of the pacer unit. He went to Hawaii after this and upon his return he was taken to surgery where the pacer was reimplanted beneath the pectoral muscles. This was done on 11-19-69. He currently has a small draining sinus but otherwise is doing well.

CASE 6: An 80-year-old white, very large male was admitted to the hospital because of heart block with a sinus bradycardia and right bundle branch block. He was taken to the X-ray unit for pacer insertion under a general anesthesia together with local. An attempt to place an electrode through the left cephalic vein was unsuccessful because of the length of the electrode catheter, which was too short in this large man. It subsequently was placed in the right cephalic vein with a subcutaneous implantation of the pacing unit. He has since done very well.

CASE 7. A 79-year-old white male was admitted to the hospital on 10-27-69. He was brought by ambulance from Nebraska where a temporary pacer had been used because of total heart block. Attempts to bring the patient to the hospital without the use of a temporary unit had resulted in asystole on two different occasions. After stabilization with the temporary pacing unit a demand pacer was placed under general anesthesia without difficulty with the electrode being passed

through the left cephalic vein and the pacer placed subpectorally on the left. He has since done well.

Technic

From the foregoing case illustrations, several lessons have been learned, and we have developed a technic which should result in fewer complications. The unit we now use almost exclusively is the *Chardack-Greatbatch Implantable Demand Cardiac Pacemaker*. The pacemaker together with the bipolar electrode come pre-sterilized.

If the patient is in severe difficulty because of his disease, and usually this is a severe heart block with inadequate circulatory output, a temporary pacing unit is placed with the electrode through an antecubital, femoral or external jugular vein. When the patient is under satisfactory control with the temporary pacer he can then undergo the implantation of the permanent pacer under elective conditions. The procedure must be done where there is image intensification fluoroscopy to enable adequate visualization for electrode placement. Proper positioning of the electrode is of the utmost importance.

Drugs and proper electrocardiographic monitoring must be available for emergency use should asystole or an ineffective arrhythmia occur during the operative procedure. A defibrillator must be in readiness. It is desirable to have an external pacer available in case there is temporary difficulty during the operation. This step is probably not necessary if a temporary pacer is in use. Control of the heart rate can usually be obtained by intravenous isoproterenol solution (1 mg. in 500 cc of normal saline), Lidocaine for intravenous administration should be available in case of cardiac irritability.

Anesthesia may be accomplished by local, supplemented by a sedative in most cases. If the patient is a good risk candidate, a general anesthesia can also be used. If difficulties are anticipated, the patient may be more comfortable under a general anesthesia, particularly if the procedure becomes lengthy.

The operation is begun by making an incision beneath the clavicle of sufficient size to develop a pocket for the pacing unit to be inserted. Our personal preference is the left side for there seems to be less tendency for electrode withdrawal from this side. We prefer the cephalic vein as the site for placing the electrode. In some cases this vein is not large enough to admit the electrode. If this vein is not satisfactory, an incision is made in the neck and the external jugular is identified. This vein is utilized if of sufficient size, but occasionally it too is too small. In that case the internal jugular is used and there is never a size problem with this vein. After the electrode is inserted into the vein, the distal vein is ligated.

The electrode is then passed into the superior vena cava and into the right heart and into the right ventricle. Fluoroscopic visualization is most important. Ideally the electrode tip should wedge in the tip of the right ventricle beneath a trabeculation. Under fluoroscopic visualization the tip of the electrode should move with the tip of the heart.

Placement of the electrode is aided by leaving the stylets in place and by imparting a slight bend to the stylet before placing it in the vein. This enables better control of the tip of the electrode if it becomes necessary to rotate it in order to facilitate entry into the heart, right ventricle or for proper placement in the ventricular tip. One difficulty frequently encountered in passing the electrode is that it often will pass down into the inferior vena cava and liver rather than into the heart. This is where the curve in the stylet is helpful. Also rotating the patient onto his left side and slightly forward often helps in getting the electrode in place.

After the electrode has been placed in a satisfactory position the electrodes are connected to the terminals of a temporary pacemaker unit and the unit is activated to see if the heart is indeed being paced. This can be done with alligator clamps and sterile wires. A calibrated output current control is necessary. Current is reduced until capture is lost and the milliamperes noted. If the value is greater than 1.5 milliamperes, the electrode should be repositioned until this value is achieved. The terminals are switched to determine which electrode exhibits the lower threshold for cathodal stimulation. The terminal which does exhibit the lower threshold is the one that will be connected to the negative pulse generator terminal.

After determining which electrode terminal will be the negative pole, the stylets are withdrawn and the electrode is fastened securely with heavy mersiline ties. Several of these ties should be used to give stability to the electrode and to preven electrode retraction. Mersilene is used in preference to silk because the tensile strength of silk diminishes with time and allows the electrode to retract. Also care should be taken not to leave a coil or bend with tension on the electrode against the tip of the ventricle as this predisposes to perforation of the heart.

At this point a pocket should be formed inferior to the clavicle for placing the pulse generator. If the patient is very thin and there is any question of tension of the skin over the pulse generator, the pocket should be placed below the pectoralis major muscle for additional insulation. If the electrode has been placed in a jugular vein it will be necessary to make a tunnel from the neck to the pocket for the pacer unit. The electrode is then passed through this tunnel to the pocket. The electrodes are then connected to the pulse generator and checked for adequate pacing. If pacing is adequate, an x-ray is taken for reference and the position is checked finally by fluoroscopy. If satisfactory, the electrode should be secured without tension to the fascia to prevent rotation and the pulse generator placed in the pocket with the control arm placed up in a position that is palpable so that the rate may be adjusted at a later date if it need be. The rate is adjusted to the desired frequency, usually 70-80 beats per minute, and the pocket closed as snugly as possible about the generator. The wound is drained.

ECG monitoring is maintained for 48 hours and the patient is allowed to ambulate after that if there are no other contraindications. Most patients have gone home in 5-7 days. A chest x-ray is taken before discharge to note if there has been any change in position of the electrode. If there is change it will usually be in the first week.

Antibiotics are utilized as a phophylactic measure until after the drain has been removed. Anticoagulation is not required.

Complications

The list of complications from this procedure is extensive. Table 1 lists these. Mortality from the procedure is low, however. Lagergren[9] in reviewing 305 cases from five Clinics in patients ranging in age from 10 to 89 years with a duration of time from six months to 3½ years postoperative pacer insertion, found a mortality rate of 16 per cent. Most of these deaths were in the first year. The cause of death due to the pacer or its complications occurred in only seven of the 48 deaths with remaining deaths due to intercurrent disease or undetermined cause.

TABLE 1
COMPLICATIONS

1. Electrode withdrawal.
2. Skin erosion by the generator or wire or both.
3. Infection.
4. Ventricular perforation by electrode.
5. Electrode fracture and generator failure.
6. Perforation of interventricular septum by electrode.[14]
7. Inhibition of pacing impulse by swept frequency technic for testing radio antenna.[15]
8. Thrombus formation on electrode which had looped into the pulmonary artery.[16]
9. Synchronous diaphragm contraction secondary to perforation of myocardium.[17]
10. Malplacement of pacemaker catheters in the coronary sinus.[18]
11. Threshold increase.[11]

In the undetermined deaths no pacer defect could be found at autopsy. When a comparable group was treated on medical regimen alone, there was a 54 per cent mortality in two years with a 31 per cent mortality in four weeks. Parsonnet reporting a 2½ year experience found an overall complication rate of 19 per cent with most complications in the first six months.

The most frequent reported complication has been electrode withdrawal. This can be the result of several factors, most of which have to do with the anchoring of the electrode. It is felt that with the placement of the electrode in the cephalic vein and by the use of heavy Mersilene ligatures, the incidence of electrode withdrawal is decreased. If a jugular vein is used, the internal rather than the external produces a lesser incidence of both electrode withdrawal and skin erosion.[10] The patient should be warned against self-manipulation of the pacer or electrode beneath the skin as this has been reported as a cause of electrode migration.[11]

Deep placement of the pulse generator without skin tension will lessen the chance of extrusion with its subsequent infection. This complication is the cause of the next large category of difficulties. If infections persist the unit must be removed and a new one placed in a different position.

If the patient is quite tall, the electrode designed for reaching to the abdominal wall should be considered because the regular length may be too short as was the case in our patient, No. 5.

Perforation of the ventricular wall by the electrode is a fairly frequent complication. Care to prevent pressure against the ventricle will help to avoid this problem. In the past these perforations have not been of severe consequence except for the loss of pacing. Most of them have been handled simply by pulling the electrode back and repositioning it. Some physicians prefer to leave the electrode in place if it is not easily withdrawn. Contrary to what might seem to happen, pericardial tamponade from a perforation has not been a major problem.[12]

Use of electro-cautery is safely tolerated if the grounding plate is placed well away from the pulse generator and if cautery is not used at a distance closer than 2 inches from the generator.[13] If the stylets are withdrawn from the electrode after positioning, electrode wire fracture as a complication is very unlikely. The remaining complications are very rare and are listed only for interest.

Conclusion

In conclusion then it may be said transvenous cardiac pacing may be accomplished with low mortality in a hospital that has an image intensifier fluoroscope and proper ECG monitoring. The chief indication is heart block with temporary pacing being indicated for some cases of acute myocardial infarction. Complications are high but with proper care can be held to an acceptable level. A small personal series of cases has been reported and some findings in the literature have been noted. •

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Drug abuse rehabilitation program for youth

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The Wyoming State Mental Hospital has instituted an unique program for the rehabilitation of our youth afflicted with drug abuse. Because it presents many of the problems to be overcome and some of the attempts to solve them, it is likely to be of regional, if not national, interest.

The present Drug Abuse Rehabilitation Program for Youth (DARPY), first organized in January, 1969, with the help and assistance of Dr. Karn, includes an educational and a therapy phase. We found to our dismay that almost all of the staff were ignorant of the problem and were apprehensive as to how to deal with the junkies. Dr. Yolles has indicated, "Drug abuse has reached epidemic proportions in the United States."[1]

The educational phase consists of approximately 18 hours of educational seminars, guided discussions, and films. At the end of each educational phase, participants are involved in a 3 to 5 hour critique led by a DARPY counselor. After completion of the educational phase, each patient in the DARPY program is included in one of three ongoing, peer-oriented, "gut-level", confrontation type therapies. These are not conventional psychotherapies—they have evolved out of a combination of conventional group psychotherapies with some special technics adopted from other drug programs, Synanon, and some special innovations in technics developed at the Wyoming State Hospital. Adopted from the Phoenix House in New York are two types of encounter groups:

1. The basic encounter is the "hall encounter." This is especially for newcomers, and emotional catharsis is the goal; the accuracy of psychological confrontation or interpretation is not important. It is a sort of training ground where the newcomer can both loosen up and toughen up psychologically, and learn to play the encounter. In this hall encounter there is no appointed leader, although an unnamed group leader might emerge from the group interaction.

2. The more advanced encounter is the staff tutorial encounter. Here there is an appointed leader who controls a group of experienced participants. He commands a powerful force and can spearhead an attack and harness the energy, insight, and experiences of the group by bringing it into focus in turn on each participant. The emotional impact can be strong indeed. These sessions serve a didactic purpose, for each member is a participant observer of ongoing group processes as well as the individual styles of defenses which are employed by the participants.

One adaptation from Synanon is that of only one permanent rule—no physical violence. "Gut-level" type of therapy is another

adaptation from Synanon. This is a "hold no punches" type of therapy that brings a junkie to "reality" rather quickly and oftentimes provokes honesty rather than permits the patient to maintain a facade for an extended period of time. Two examples of our innovations are "Mystical Voyages" and "The Hot Seat." Mystical voyages consist of all participants sitting shoulder to shoulder with backs to center. Each participant relates, in turn, an ongoing part of a spontaneous mystical voyage wherein all members take part. Then they have to guide themselves back into reality—the society they left. This enables the junkies to experience fantasy without drugs and to realize and anticipate the long and very real journey back into their individual communities. In the "hot seat," every prospective DARPY graduate must satisfy all of the other members of the group of his renewed strength and sincerity to cope with the outside pressures and not to continue his drug abuse. This technic has no time limit; the aspiring junkie must satisfy all of his peers—in one hour or in 16 hours, if necessary.

In addition to 12 to 15 hours of DARPY therapy per week, each patient is involved in one or more marathon therapies monthly (eight to 30 hours continuously). One 30-hour marathon therapy session may accomplish as much as three months of regular therapy because it is extremely difficult for a patient to maintain the defensive successfully for such an extended period of time, and to thus avoid the realities of his or her situation.

We are treating patients who have either a psychological or physical dependence, or both. If we combined all of the drugs used by all of the patients presently in treatment, the startling amount would be approximately 951 L.S.D. or S.T.P. trips, 100 tubes of glue, 3½ pounds of Speed, 1½ pounds of opium, an indeterminable amount of marijuana, plus an odd variety of barbiturates, tranquilizers and mood changers. These data themselves are relatively unimportant; however, it gives you an idea of the problem we are facing directly at the Wyoming State Hospital and, more importantly, in Wyoming. We don't know why what girl or boy takes what drug. We don't know why they take drugs at all!

Dr. Ostow of the Society for Adolescent Psychiatry, Inc. has researched some formulations on motivation for drug use. They are: (1) drive gratification, (2) facilitation of maturational forces and the detachment from infantile love objects, (3) defense against depression and pain and defense against anxiety, (4) a means of self-destruction, for dying and rebirth (fantasies), and as a flirting with death and challenging fate. He states, "Drug use should be looked at as a method of solving a problem, a lousy one." He believes that the drug is the instrument of the self-destructive drive, and that merely removing the drug doesn't change the drive.[2]

An interesting finding was observed in a test group of 500 college students at the University of Pittsburgh. The use of drugs probably occurs among those students whose behavior, attitudes, or values, and self-image, were indicative of opposition to the traditional established order. Such attitudes as disrespect for the law and skepticism about worthwhileness of college, coupled with such behavior as participation in mass protests and "happenings," match the self-portrait of the drug user as anti-establishment, cynical, and rebellious. For these students, drugs are the recreational choice, and their use is a central core of their subculture.[3] With the preceding we concur—our findings are much the same!

Using the responses of 333 Duke University students, 36 attitude items were factor analyzed, and five relatively pure factors emerged. These can be described as (1) insecurity, (2) fear of loss of control, (3) inclination to adopt the sick role, (4) denial or avoidance of the influence of drugs, and (5) curiosity about and willingness for being stimulated or changed. The scores for willingness to use the agents yielded three principal factors: drugs (energizers, hallucinogens, and opiates), social stimulants (non-alcoholic stimulants, tobacco, and liquid intoxicants), and sedatives (sedatives, analgesics, and tranquilizers). Again, our findings are similar in extent and content.

In terms of the relationship between the attitude and usage factors—the combination of doubt about, and wish to change the self, plus a lack of fear of losing control, and a general confidence in the effectiveness—of drugs is related to using any type of agent. A combination of curiosity about one's potentialities and an absence of fear of loss of control relates more specifically to using those agents known as "releasors."[4] Our data are again closely related to the foregoing.

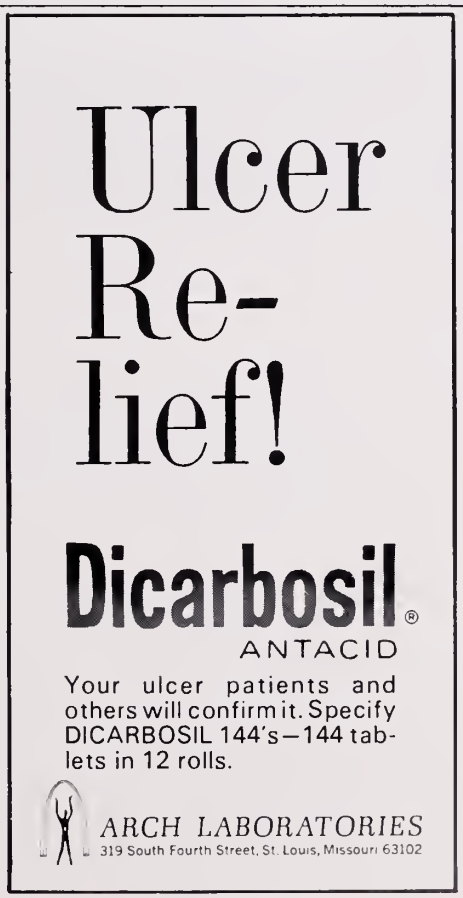
To date, the DARPY program has evaluated 40 drug users and consists of 20 patients, eight of whom have been released. Of the present 20 patients, there are four females and 16 males. An interesting fact we have uncovered is that the only common link between patients is the abuse of drugs.

The response to therapy at this time is indeterminate, but hopeful. This can be attributed to the Wyoming State Hospital peer-oriented method. Based on the successful precedent in the Alcoholic Treatment Services program, it has been found that actual drug experience affords a better background for DARPY therapists than does so-called conventional training in psychotherapy and counseling. Also, to aid the DARPY counselors, we have a backup team consisting of medical, nursing, and psychiatric personnel, social services, educational experts, and a psychologic service. DARPY is trying to develop a test battery to determine the extent of drug damage; and the meager results so far are disconcerting. It has been found that there is a residual, subtle, ideo-affective, neurologic dysfunction which has persisted, in our experience so far, up to six months. Time will tell us more.

We seek to find why our youth take to the use of drugs, and we offer alternative ways to cope with the difficulties arising out of their individual realities. However, this is only 50 per cent of the total treatment. The final phase, reintegration back into the community, must be done with your help!!!

The reluctance of the populace of Wyoming (and other states) as a whole to accept the basic responsibility of treatment and after-care services is understandable. Addiction in the young, and so-called alienated, is a unique symptom in medicine. It is a symptom of overt comfort rather than discomfort, providing relief from emotional as well as physical pain. This comfort goes even further by seeming to lessen the tensions of psychic and biologic drives. The uniqueness of the symptom, the lack of successful methods of treatment for this problem, the high rates of recidivism, plus the difficulties in treating the individual patient, directly influence the reluctance to accept the responsibility for treatment. Characteristics of the junkies which make them difficult to treat include the following: (1) inappropriate anger, (2) distrust of his fellow man, (3) disbelief in real human relationships, (4) immaturity, (5) passivity, (6) dependency, (7) inability or unwillingness to tolerate discomfort, (8) unwillingness to postpone gratification, and (9) personality deterioration with abulia!

Let us assume that a junkie has completed the DARPY program successfully, and he or she is released. Continued abstinence upon return to the community will be difficult to



accomplish because of the chronic nature of the illness, the individual personality characteristics, the lack of public understanding of the nature of the problem, and the lack of resources to facilitate abstinence. The former junkie returns to his home from this hospital under extremely difficult circumstances. He is back in the environment which helped him spawn his addictions, and people are likely to know he is a former junkie. Usually, he returns with no money, and when he goes looking for work or for school, or for training, he finds that employers, teachers, etc., are very wary about accepting ex-junkies. Chances are that his family situation has been strained by his long absence and by the community's obvious disapproval of addiction. His "straight" friends may disapprove of him, and his junkie friends are all too available. Social agencies usually are reluctant to help because they feel his chances of successful adjustment are too slight to warrant the necessary expenditure of time and effort. (What they mean to say is that they don't know how to help.) It's not easy for an ex-junkie, and he may revert to drug use to express his disenchantment with the community even though he was once eager to break this habit. Using this type of situation, in which most former addicts will find themselves, as a frame of reference, then recidivism to drug abuse may be easily understood.

The lack of follow-up care, or out-patient supervision on the community level, to assist the junkie once he is discharged from the Wyoming State Hospital, could and does nullify any benefits the addict may have received while in the institution. To enable the individual addict to resolve his dilemma and to facilitate his successful readjustment, a day-night center for rehabilitation must be created—in the larger communities at least! People released from DARPY would or could spend half of each 24-hour period at this center. A full range of services must be provided, including a street-work staff reaching out into the neighborhood and the precinct community; psychotherapy, drug therapy, vocational counseling, educational rehabilitation, selected vocational placement, sheltered workship, family counseling, and recreational therapy must be made available. "Results in the area of treatment have often been discouraging, particularly if the criteron of success is total abstinence from drugs. At least part of the difficulty with treatment has been that the addict was often treated in a hospital far from his home community and was not adequately followed up upon release."[5] •

REFERENCES

[1] Drug Abuse—Stanley F. Yolles, MD; Memo from the Director, NIMH; May 1969. ,,

[2] Muriel R. Straetz, MD, Mortimer Ostow, MD, Society for Adolescent Psychiatry, April 15, 1969.

[3] Psychiatry Digest, June 1969, p. 47.

[4] Psychiatry Digest, May 1969, p. 27.

[5] Drug Abuse—Statement by Stanley F. Yolles, MD; Memo from the Director, NIMH, dated May 1969.

UTAH

MINUTES OF THE HOUSE OF DELEGATES UTAH STATE MEDICAL ASSOCIATION

THIRTEENTH INTERIM MEETING
SALT LAKE CITY, UTAH—MARCH 19, 1970

FIRST SESSION—9:00 A.M.

The Thirteenth Interim Meeting of the House of Delegates of the Utah State Medical Association was called to order at 9:15 a.m. in the Auditorium of Skaggs Hall, College of Pharmacy, University of Utah, Salt Lake City, Utah, by Speaker of the House of Delegates, **William R. Christensen,** MD, and the following proceedings were had:

The invocation was offered by **Louis G. Moench,** MD.

Minutes of the Seventy-Fifth Annual Session of the USMA House of Delegates held September 10, 1969, as contained in the January 1970 issue of the *Rocky Mountain Medical Journal*, were approved as printed.

Report Of The President—John H. Rupper, MD

In the past six months several objectives determined prior to my Presidency of the Utah State Medical Association have been pursued and achieved. Among these are the **Title XIX** or Medicaid problems. The Fee Schedule Committee and its Executive Committee, under the able leadership of its Chairman, **Dr. Scott M. Smith,** achieved a **Memorandum of Understanding** with the Division of Family Services of the State of Utah. This is a notable accomplishment and represents the best relationship we have had with the Welfare Department in many years. The Memorandum of Understanding consists of nine points to which the Division of Family Services and the Utah State Medical Association agreed.

This Memorandum of Understanding has definite benefits to both parties and every effort of each party should be made to comply with it. In regard to the problems of the State of Utah, we physicians can be helpful in reducing the costs of medical care by being ever conscious of saving money for the State by careful consideration of the actual needs of the patients regarding diagnostic studies, length of stay, or necessity of hospitalization, frequency of office visits, etc., always being mindful that there is only one standard of care for all patients regardless of whether they are Medicare, Medicaid, welfare, or private patients. That standard of care can only be the one which provides the best of care. This consideration of keeping costs down should apply to all patients at all times. There can be no double standard of care for patients—one for welfare and one for private patients. State officials must realize as well as physicians that legally there can only be one standard of care for all patients and that is adequate care for the best welfare of the patient.

Recently I was called to the Governor's Office to meet with the Division of Family Services, the Health Department, and the Budget Committee of the Senate. The State of Utah is in a bind with their welfare money. The reason for this is that anyone who receives a welfare check is automatically entitled to Medicaid care. The State of Utah receives about sixty-eight cents from the federal government for every thirty-two cents they put out. The problem is that the State of Utah hasn't enough money to match the federal money. This is not only true in this State, but in many states, and the real problem lies with federal legislation which we have had inasmuch as society is demanding a more rapid upgrading of medical care than we can afford at this time. This was pointed out to the Governor. He recognized that this was the case. However, he pointed out that their problem was a budgetary one at this time, and asked what we, as physicians, could do. It is very important that we do something about utilization, and I think, as physicians, we can do a better job of controlling utilization.

Associated Research, under the supervision of **Dr. O. Wendell Budge,** Chairman of the *Medical Economics Committee,* has just submitted the report on the recent survey of the "cost involved in conducting a medical practice in Utah". We had only about three hundred and thirty-one physicians out of a thousand make reports, and I think this can be improved upon. I have asked a select committee of the Chairman and two other members of the Medical Economics Committee to review and report which portions and which tables might be released for the use of Blue Shield as one of the factors in determining the reasonableness of usual and customary fees as required by law. I feel this report could have been more meaningful had a majority of our physicians filled it out. I recommend that this survey be repeated on an annual or at least a biennial basis and that, in light of our experience, we revise its questions with the help of several accountants so that the information desired is more readily available from each physician. If we do not acquire more and better means of justifying the reasonableness of our fees, the prerogative to determine them may be taken from us and exercised by others.

On November 20, 1969, the *Utah State Medical Association, the Utah State Hospital Association, the Utah State Nurses' Association, and the Utah State Pharmaceutical Association* met together for their *Second Annual Conference* to consider problems related to the *Joint Statement of Functions* adopted by the organizations over one year ago. Certain problems were identified; namely, the inadequacy of the laws of Utah for the modern practice of medicine, nursing, and pharmacy in the hospital setting. It will be necessary for the Nursing Liaison Committee to get together with small

groups of the affected parties and work out new laws in time to present to the next Legislature in 1971.

I am pleased to report that the *Constitution and By-Laws Committee* is making excellent progress on the revision of our Constitution and By-Laws. The seventh draft has been completed and this is going to be presented today for consideration in one of the reference committees.

The Medical/Legal Council has been working vigorously to find solutions to the problem surrounding malpractice insurance. An Unexpected Result Survey Form, which was formerly the Incident Analysis Report Form, is at the point of acceptance now, and this, too, will be considered today in your reference committee. I feel that much good can be derived from the use of this form and I hope that all physicians will recognize this and give it a fair trial. A conference of physicians and lawyers was held in Ogden this past fall and was well attended, and, I feel, accomplished some good. This type of seminar should probably be continued on a yearly basis.

I wish to thank **Dr. Richard Call** at this time for his excellent service as a Senator in the Utah State Legislature. He has announced that he will not run for the Legislature this year, and we must encourage other physicians to make the effort to become elected. Physician representation in the Legislature is desperately needed.

I also wish to thank **Dr. Stan Rees** for his many years of service in the Legislature. I definitely hope that he will continue to aspire to a seat in the Legislature. His presence there has been very valuable.

This brings me to the subject of the *Utah Medical Political Action Committee* and the *American Medical Political Action Committee* and the need for funds in this election year. In the past, AMPAC has sent more funds to the State of Utah's political cause than we have contributed through UMPAC. I cannot stress enough how important your $25 contributions will be this year, and I would like to see everyone make a contribution if they can.

The next thing I want to discuss in the political arena is that of the candidacy of **Dr. Drew M. Petersen** as a Trustee of the American Medical Association. He has signified his intent to run after receiving encouragement from a large number of delegates of the American Medical Association. Obtaining this post by Dr. Petersen would be an honor to him and a great honor to us. I know that Drew would represent us well. In order to win this post, we will need money to conduct an adequate campaign among the delegates of the American Medical Association. I am, therefore, soliciting voluntary contributions from the membership. In the recent past the Utah State Medical Association was honored to have **Dr. George M. Fister** represent us as Trustee and later as President of the American Medical Association. I hope we can continue to serve the American Medical Association by sending our native sons to represent us in high positions. I view this as a great opportunity, and hope you will signify it by your contribution.

I offer my thanks to the Auxiliary for their efforts in our behalf. They have been anxious to help, and requests I have made have been promptly accepted without question. I hope that all of you encourage your wives to join in the activities of the Auxiliary. They have been very resourceful and have developed and carried out a number of programs of their own which have benefited the Utah State Medical Association.

The work of **Mr. John H. Snow** and **Mr. John S. Boyden, Jr.,** has been beneficial to us and greatly appreciated in the recent session of the Legislature and in other matters pertaining to our Association. As you know, the Medical Practice Act was successfully amended to allow physicians who previously had passed a comparable basic science exam in some other state the right to be granted a license in the State of Utah without having to take our Basic Science Examination. A number of areas in the Drug Abuse Act were modified successfully by advice from our Legal Counsel in order to provide a better law. The law requiring triplicate prescriptions for narcotics did not pass and I am sure that few physicians feel this would have served a useful purpose.

The first half of my term of office has been very active. I thank all of those who have been so effective in their work; namely, the Executive Committee, the Board of Trustees, Mr. Hoyt W. Brewster and his staff, and the many committees of the Utah State Medical Association. They are all to be commended for their help, efficiency, and diligence in their work and their dedication to our objectives of better health for all the people of the State of Utah.

Report Of The Secretary—Allan H. Barker, MD

The Secretary has been in attendance at most of the Executive Committee meetings and the Board of Trustees meetings as an active participant in the day-to-day problems of the Association. In addition, the Secretary serves as Chairman of the Scientific Program Committee, and preparations for the September meeting are progressing satisfactorily with the aid of a very competent committee.

The Secretary is indebted to the staff and the Executive Director of the Association for the efficient and competent manner in which they discharge their responsibilities.

Report Of The AMA Delegate—Ralph E. Jorgenson, MD

The highlights of the AMA Convention were in trying to do something towards taking care of the Nation's poor and in trying to work out some cooperation on a comprehensive health planning program.

The AMA also made a clear-cut statement on marijuana, and plans to discontinue the AMA-ERF's Institute of Biomedical Research as soon as its Board of Directors determines it feasible. AMA started out with a rather ambitious plan a few years back, but had we continued this it would have raised the dues about sixty dollars per physician per year, and the Delegates therefore chose to abandon it.

Dr. Drew Petersen was elected President of the "Aces and Deuces Club," which is a club of the states that have only one and two delegates.

I wish to express appreciation to Mr. Hoyt Brewster, Dr. Petersen, Dr. Merrill Daines, and Dr. Rupper, who were also present, for their support.

Report Of The Executive Director—Mr. Hoyt W. Brewster

There is one item of business that I think would be of interest to you gentlemen that does not appear in my report as printed in the Handbook, which took place yesterday.

There has been some conjecture as to the wisdom of the extensive publicity that was given to the malpractice insurance problem a year ago. I feel that this publicity was vindicated, at least as far as the doctors are concerned. We have just had a rather interesting by-product accrue to us, which I am sure is a direct result of the publicity that was given to our problem a year ago. We received from the Insurance Advisory Committee of the Utah State Legislative Council an invitation to come and meet with a committee of representatives and senators in the State Capitol Building to discuss possible ways of alleviating the pressures that are attendant to this malpractice insurance problem. You well know that if the attempt had been made from our side that immediately there would have been the hue and cry of vested interest, and that the doctors are trying to shelter themselves unduly and unjustly. But, with the invitation coming from their side, it changes the whole complexion considerably. And so, we don't know at this point what will result, but at least we have an involvement of the State Government and an interest in the problem; that it is not only a doctor's problem but that it involves the citizenry as well; that it involves the legal profession; that it involves the insurance industry, and many other facets of our public life. I might say that this meeting turned out extremely well, that it is the first one of many that will be held, that they have requested from us statistical data that we can provide which will be extremely meaningful to the Legislators, and that at such time as the courses of action that should be taken have been determined that we will have a considerable hand and influence in what is done, and hopefully it will result in solutions that are meaningful.

I felt that this would be an appropriate time to call this matter to your attention.

SECOND SESSION—2:00 P.M.

The Chairman of the Credentials Committee reported a quorum in attendance, and the Second Session was declared in order.

The presence of *Mr. David B. Weihaupt*, Assistant Director of the AMA Division of Public Affairs, was then acknowledged. Mr. Weihaupt was called upon for a brief report concerning matters of interest at the AMA.

Reference Committee Chairmen were then called upon for recommendations pertaining to the various reports submitted by officers and committee chairmen of the USMA.

The following four resolutions were also presented to the House of Delegates, which received approval with some minor amendments:

UNEXPECTED RESULTS SURVEY (URS)

WHEREAS, Professional liability claims and suits against physicians and the money demands of said claims and suits have sharply increased in recent years; and

WHEREAS, As a direct result of such increases, some liability insurance carriers have refused to write certain liability insurance coverage for physicians in Utah and the trend would indicate a potential worsening of the situation; and

WHEREAS, The increasing threat of professional liability claims and suits has forced many physicians to limit the scope of their medical practice or has caused them to render medical care which is legally defensible rather than medically necessary for the welfare of the patient; and

WHEREAS, The Utah State Medical Association has made extensive study of possible solutions and/or ways to curb or control the professional liability problem; and

WHEREAS, The Utah State Medical Association has caused to be established a new Medical/Legal Council charged to make studies and recommendations for the possible improvement of the current situation; and

WHEREAS, The Medical Legal Council has recommended, with the USMA Board of Trustees' ratification, the implementation of the Unexpected Results Survey (URS) program with the physicians of Utah; therefore be it

RESOLVED, That the House of Delegates of the Utah State Medical Association accept and endorse the Unexpected Results Survey (URS) program as a long-range means of providing information leading to improvement in the professional liability insurance situation, thereby enabling worthy physicians to practice medicine of maximum benefit to patients and without fear of personal financial disaster.

TREATMENT OF MASS CASUALTIES

WHEREAS, In the event of a catastrophe requiring treatment of mass casualties, someone should have the authority and responsibility to coordinate the medical care of injured patients; therefore be it

RESOLVED, That the chairman of the Emergency Disaster Advisory Committee (Director of Utah State Division of Health), the Governor, and the President of the Utah State Medical Association be encouraged to concur in the appointment of a physician and his deputy to coordinate the medical care of mass casualties in each of the eight health districts of the State of Utah; and be it further

RESOLVED, That a five-year term of appointment is recommended; and be it further

RESOLVED, That it is recommended that the appointed physicians should be members of the State Emergency Disaster Advisory Committee.

MEDICAL ASPECTS OF MENTAL RETARDATION

WHEREAS, The problems, recognition, diagnosis, management, and prevention of both mild and more severe mental retardation are to a large extent medical in nature; and

WHEREAS, There are developing increasing State and local resources for dealing with mental retardation; and

WHEREAS, In the development of these resources, there has appeared to be inadequate means for contributing and coordinating the resources of the medical profession in the solution of the problems of mental retardation; therefore be it

RESOLVED, That the Utah State Medical Association acknowledge concern and responsibility in the broad medical aspects of mental retardation; and be it further

RESOLVED, That the Utah State Medical Association, through its Committee on Mental Retardation or its agents, conduct a study of the status of coordination of the medical aspects of mental retardation in both the private and public sector at the State and local level.

DANGERS OF MARIJUANA

WHEREAS, The American Medical Association, through its House of Delegates, at its last meeting, approved a policy statement calling attention to the dangers of marijuana, and

WHEREAS, The members of the Utah State Medical Association share this concern about its danger, especially in the hands of our youth; therefore be it

RESOLVED, That the House of Delegates of the Utah State Medical Association endorse this policy statement on the danger of marijuana; and be it further

RESOLVED, That the members of the Utah State Medical Association accept the responsibility frequently and forcefully to call attention to the problem of all forms of drug abuse and drug dependence, including those which arise from the use of marijuana; and be it further

RESOLVED, That this policy position be communicated to educational and health agencies and to the news media so that there can be no uncertainty as to our position as a group of physicians.

President John H. Rupper then reported that the following members of the Utah State Medical Association had passed away since the last session of the House of Delegates held on September 10, 1969:

Phillip M. Chase, MD—Salt Lake City, Utah
George A. Cochran, MD—Salt Lake City, Utah

A moment of silence was observed in honor to their memory.

Reports of the Councilors from each of the Component Societies were then called for, and these received unanimous approval of the House.

There being no further business, the meeting was adjourned at 4:00 p.m., March 19, 1970.

Two big ideas I learned about smoking are that nicotine obeys whatever command the smoker gives, and that a person should find a clue to his psychological reason for smoking.

Peter Steele Bixby
SMOKE SIGNALS,
November, 1969

IMPORTANT NOTICE TO ALL PHYSICIANS

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THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Allergy In Children: By Louis Tuft. Philadelphia, 1970, Saunders. 561 p. Price: $19.50.

Art of Loving: By Erich Fromm. New York, 1956, Harper. 133 p. Price: $6.95.

Cerebral Angiography: By Hugo A. Krayenbuhl and Mahmut G. Yasargil. 2nd ed. Philadelphia, 1968, Lippincott. 401 p. Price: $49.50.

Devotionals by A Physician: By Claude A. Frazier. Springfield, Ill., 1970, Thomas. 201 p. Price: Review.

Foetal Autonomy: By Ciba Foundation. London, 1969, J. & A. Churchill Ltd. 326 p. Price: Gift.

Gas Chromatography In Biology and Medicine: By Ciba Foundation. London, 1969, J. & A. Churchill Ltd. 213 p. Price: Gift.

History of Preventive Medicine: By Harry Wain. Springfield, Ill., 1970, Thomas. 407 p. Price: Review.

Homeostatic Regulators: By Ciba Foundation. London, 1969, J. & A. Churchill Ltd. 327 p. Price: Gift.

Human Sexual Inadequacy: By William H. Masters and Virginia E. Johnson. Boston, 1970, Little, Brown. 467 p. Price $12.50.

Medical Licensure and Discipline In The United States: By Robert C. Derbyshire. Baltimore, 1969, Johns Hopkins. 183 p. Price: $9.00.

Mutation As Cellular Process: By Ciba Foundation. London, 1969, J. & A. Churchill Ltd. 244 p. Price: Gift.

Parenteral Nutrition: Edited by H. C. Meng and David H. Law. Springfield, Ill., 1970, Thomas. 594 p. Price: Gift.

Progress In Clinical Cancer. v. 4: Edited by Irving M. Ariel. New York, 1970, Grune & Stratton. 405 p. Price: $19.75.

Spectroscopic Approaches To Biomolecular Conformation: Edited by D. W. Urry, Chicago, Ill., 1969, American Medical Association. 314 p. Price: $15.00.

Toward Therapeutic Care; A Guide for Those Who Work With The Mentally Ill, v. 7: By Group for the Advancement of Psychiatry. 2nd ed. New York, 1970, GAP. 126 p. Price: $2.80.

Urology: Edited by Meredith F. Campbell and others. 3rd ed. Philadelphia, 1970, Saunders. 3 vols. Price: $110.00.

Book Review

Medical Licensure and Discipline in the United States: by Robert C. Derbyshire, MD. Johns Hopkins Press, Baltimore, Maryland, 1969. Price: $9.00.

This volume, with the stated intent of presenting an analysis of the practical aspects of Medical Licensure in America today, accomplishes its purpose very well.

The author presents a strong case for revamping the present system of state boards to provide for greater interstate endorsement of medical licensure. He points out the wide variance of requirements and standards maintained by the several states. The basic science certificate presently required in twenty states and the District

of Columbia provides a good example of the varying requirements.

Professional incompetence, felonies, medical imposters, narcotic violations and addictions are reviewed as well as the powers and limitations of the licensing boards to protect the public and to discipline those not competent to practice medicine.

Dr. Derbyshire provides the reader with an overview of the entire field of medical licensure including such subjects as Basic Science Laws, the need for and the problems inherent with universal reciprocity between states, the makeup of the state licensure boards and their areas of success and failure in fulfilling their licensure and disciplinary functions.

Larry Miller,
Asst. Executive Secretary
Colorado Medical Society

OBITUARIES

Colorado

Maurice J. Katzman, MD, Denver cardiologist, died March 3, 1970 at the age of 76.

Born in Russia August 15, 1894, Doctor Katzman came to the United States where he attended the Denver Public Schools and the University of Denver receiving his B.A. in 1917. Afterwards, he attended the University of Colorado School of Medicine receiving his M.D. in 1919.

Doctor Katzman was considered one of the leading cardiologists in the Midwest. He was commended by President Harry S. Truman during the Korean War for special services to the Army. He has served as president of the Medical Staffs of General Rose and St. Joseph's Hospitals as well as consultant at several other Denver hospitals.

Doctor Katzman was a fellow of the American College of Physicians, the American College of Cardiology and the American Geriatric Society. He also was a member of the Denver Medical Society, the Colorado Medical Society and the American Medical Association.

Besides his wife, Leah, he is survived by a son, Robert Katzman, M.D., of New York City, and two grandsons.

Louis U. Howlett, MD, born in Richland, Missouri, January 7, 1922 died May 19, 1970 from injuries suffered in an automobile accident.

Doctor Howlett attended the University of Colorado receiving his A.B. in 1942. He subsequently attended the University of Colorado School of Medicine receiving his M.D. in 1945. After an internship at St. Anthony's Hospital in Denver, he served for two years as a captain in the United States Air Force during World War II, stationed in Goose Bay, Labrador.

Doctor Howlett practiced in Golden with his father, Roger G. Howlett, MD, until 1969. He was a member of the Clear Creek Valley Medical Society, the Colorado Medical Society, the American Society of Abdominal Surgeons, and the American Medical Association.

Doctor Howlett served as President of the Clear Creek Valley Medical Society for the 1959-60 term, as Secretary treasurer for the 1948-49 and the 1949-50 terms. In addition he served on numerous committees.

He is survived by his widow, Mary Ann; two daughters, Mrs. Lynn Gonzales, Denver, and Miss Terry Howlett, Grand Junction, Colorado; 3 step children, Bill, John and Sharon Tate, Lakewood; his parents, Dr. and Mrs. R. G. Howlett, Golden; a brother, Robert, Tucson, Arizona; and a sister, Mrs. Georgia May Seiferth, Golden.

Utah

Jesse J. Weight, MD, Provo physician and former President of the Utah Valley Hospital, died May 19, 1970. He was 78.

A native of Springville, he was born April 25, 1892, and was the son of Henry Joseph and Rheuama Johnson Weight. He married Thelma Eggertsen on May 25, 1923.

Doctor Weight graduated from Brigham Young University in 1916 with a B.S. degree, and received an M.S. degree in bacteriology from the University of Chicago in 1924. He received his Doctor of Medicine from the Rush Medical College in 1931, and prior to this also spent several years studying at the University of Utah. He interned and served a residency at the Denver General Hospital, and did postgraduate work at Harvard Medical School and New York State Hospital. Doctor Weight practiced in the Provo area for 38 years. He was a former President of the Utah County Medical Society, and served actively in the Utah State Medical Association. He was the 1959 recipient of the Award of Merit of the President's Committee on Employment of the Handicapped, and served one term as Alternate Delegate to the AMA. In addition to his activities in medicine, Doctor Weight spent several years as a high school principal and teacher in biology. He was also a professor at the University of Utah.

Doctor Weight served in the U.S. Army during World War I, and at the time of his death was a High Priest in the L.D.S. Church. Survivors include his widow; a son and daughter, J. Arthur "Jerry," Bountiful; Mrs. Werner K. (Merlynne) Grill, Inz, Austria; seven grandchildren; a brother and sister, Kenneth E., Provo, and Mrs. Nellie Wiscomb, Mapleton.

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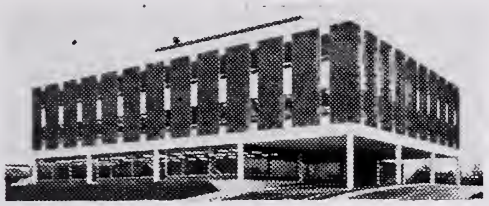

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OUR COVER PHOTO

Our congratulations to Wesley W. Hall, MD, of Reno, Nevada, elected president of the American Medical Association for the 1970-71 term.

Dr. Hall is shown here relaxing at his cabin up at the Feather River.

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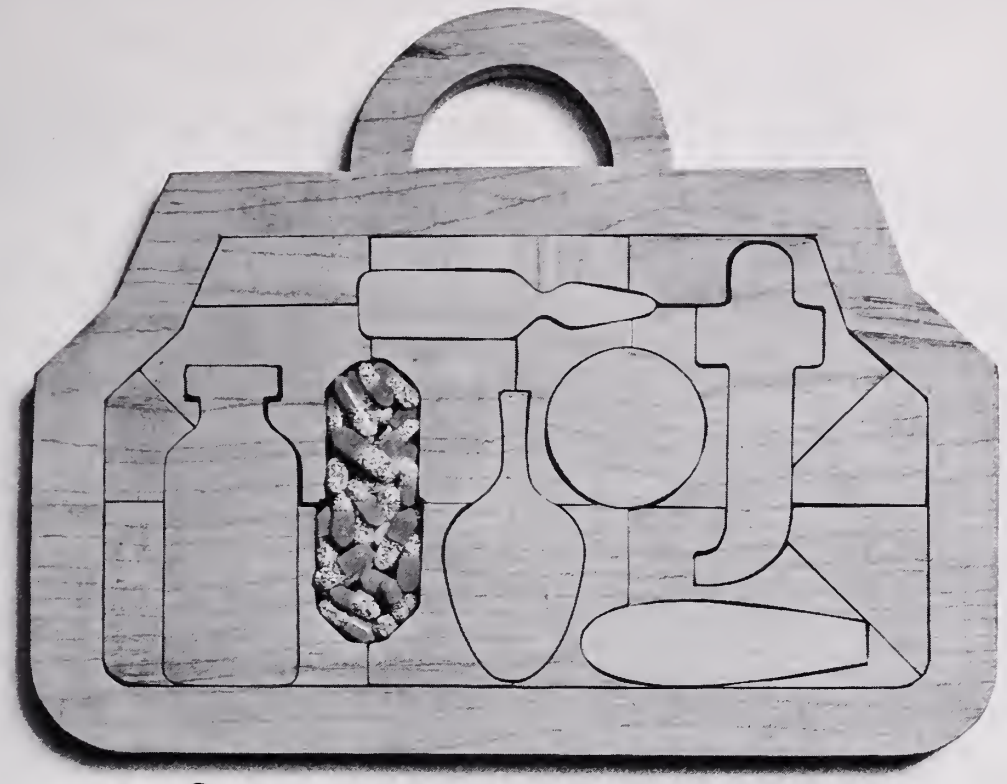

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The 92nd Annual Meeting
MONTANA MEDICAL ASSOCIATION

September 17-19, 1970

Bozeman, Montana

The 92nd Annual Meeting of the Montana Medical Association will be held on Thursday, Friday, and Saturday, September 17, 18, and 19, in Bozeman, Montana. All physicians are cordially invited and are most welcome to attend this annual meeting. There will be no registration fee.

All of the scientific and business sessions of the 92nd Annual Meeting will convene in the Student Union Building on the campus of Montana State University in Bozeman. The commercial, scientific, and educational exhibits will also be displayed in the Student Union Building.

Preceding the annual meeting, the members of the Gallatin County Medical Society will sponsor on Wednesday, September 16, a golf tournament at the Riverside Country Club in Bozeman. All physicians who plan to attend the annual meeting are cordially invited to participate in this golf tourney. Many valuable and useful prizes, including the "Goodman Trophy," will be awarded to participants. Physicians who plan to participate in the golf tourney are urged to advise the chairman of the Golf Committee, Douglas L. Schumacher, M.D., 111 South Tracy Avenue, Bozeman, Montana 59715, and to forward to him a record of their handicap.

On Wednesday afternoon and evening, September 16, a number of the medical specialty groups in Montana and several committees of the Montana Medical Association will schedule business, social, and dinner meetings.

The meetings of the House of Delegates of the Montana Medical Association will convene in the Madison-Jefferson Room of the Student Union Building. The first session of the House of Delegates will be called to order at 8:30 o'clock on Thursday morning, September 17. Upon the recess of this first session of the House at approximately 10:30 o'clock, its several reference committees will meet to study and receive testimony upon the several items of business referred to each. At 5:00 o'clock on Friday afternoon, September 18, the second session of the House of Delegates will convene for the election of officers of this Association for the coming administrative year. The third and final session of the House of Delegates will convene on Saturday morning, September 19, at 8:30 o'clock and will continue in session until all of the business of the House has been completed.

On Thursday evening, September 17, the Montana Medical Political Action Committee will hold its annual dinner meeting in the Ballroom of the Baxter Hotel, Bozeman. Following dinner, John Melcher, the member of the United States House of Representatives representing the Second Congressional District of Montana, will present an interesting and provocative address.

On Friday evening, September 18, this Association will sponsor its annual reception and banquet in the Ballroom of the Baxter Hotel. Following dinner the president of this Association, Oscar A. Swenson, M.D., Kalispell, will present awards and will install the newly elected officers. Richard L. Peterson, M.D., Hamilton, President-Elect, will present a brief address and will outline his plans and aspirations during his term of office. At the conclusion of this address, there will be dancing.

Again, we extend a cordial invitation on behalf of the members of the Montana Medical Association to all physicians in the Rocky Mountain area to attend the 92nd Annual Meeting in Bozeman.

Oscar A. Swenson, MD, President
John A. Newman, MD, Secretary

Scientific Sessions

Thursday, September 17

AFTERNOON LECTURE SESSIONS

2:30 Sprains, Strains, Teors ond Fractures of the Ankle Joint

ROBERT LARSON, M.D., Orthopedist, University of Oregon Student Health Service, Eugene

3:05 Sex ond Sexuolity

MARY S. CALDERONE, M.D., Executive Secretary, Sex Information and Education Council of the United States (SIECUS), New York

3:50 Obstetrical and Gram Negative Shock

RICHARD HEBERTSON, M.D., Chairman, Department of Obstetrics and Gynecology, University of Utah School of Medicine, Salt Lake City

4:25 Stroke, Psychological and Learning Aspects of Rehobilitotion

McKENZIE BUCK, Ph.D., Director, Speech Pathology Research, Department of Otolaryngology, University of Oregon School of Medicine, Portland

5:00 Physicol Restorotion of the Brain Domaged Patient

LELAND CROSS, M.D., Rehabilitation Institute of Oregon, Portland

Friday, September 18

7:15 Breakfast Seminor Sessions

MORNING LECTURE SESSIONS

9:00 Drug Abuse in Adolescents

BEVERLEY T. MEAD, M.D., Chairman, Department of Psychiatry, Creighton University School of Medicine, Omaha

9:35 Where Do We Go in Sex Education?

MARY S. CALDERONE, M.D.

10:30 Musculo-Tendinous Injuries of the Lower Extremity

ROBERT LARSON, M.D.

11:10 Chromosome Abnormalities Associated with Oral Contraceptives

RICHARD HERBERTSON, M.D.

AFTERNOON LECTURE SESSIONS

2:00 Stroke, Physical Aspects of Restoration

LELAND CROSS, M.D.

2:35 Intellectual ond Communications Restoration of Brain Damaged Potient

McKENZIE BUCK, Ph.D.

3:30 Physical Complaints Without Physical Findings

BEVERLEY T. MEAD, M.D.

4:10 pCO2, p02, and Blood pH in the Treatment of Pulmonary Insufficiency

NORMAN BERGMAN, M.D., Professor and Chairman, Division of Anesthesiology, University of Oregon Medical School, Portland

75th Annual Scientific Sessions

of the

Utah State Medical Association

Salt Palace Convention Center

Salt Lake City, Utah

September 9-11, 1970

Wednesday Afternoon, September 9

12:15 **Registration**
Luncheon Pragram—Challenge af the Seventies
MALCOLM C. TODD, M.D.

2:05 **Alternate Prapasals far Health-Care Delivery**
MALCOLM C. TODD, M.D.

2:15 **Kaiser Permanente's Prepaid Plan**
SIDNEY R. GARFIELD, M.D.

2:45 **Oklahoma's Experimental Plan**
JAMES L. DENNIS, M.D.

3:45 **Labor's Health Insurance Plan**
MR. BERT SEIDMAN

4:15 **AMA Medicredit Health Insurance Plan**
RUSSELL B. ROTH, M.D.

Thursday Morning, September 10

8:30 **Registration**
Film—**Foir Warning**
DONALD T. FREDRICKSON, M.D.

9:00 **The Angiagrophic Criteria far Selectian af Potients for Caranary Surgery**
MELVIN P. JUDKINS, M.D.

10:00 **Selection af Patients far Angiagrophy and Surgery in Coranary Disease**
JOHN H. HUSTON, M.D.

11:10 **Detectian af Breost Concer**
CUSHMAN D. HAAGENSEN, M.D.

11:40 **How Do Physician Cancer Registries Imprave Patient Care?"**
CHARLES R. SMART, M.D.

Thursday Afternoon

12:15 **Luncheon Buffet—The Drug Scene Taday**
LINCOLN D. CLARK, M.D.

SESSION A

2:00 **Impraving the Pragnosis of Cancer in the Alimentary Tract**
OWEN H. WANGENSTEEN, M.D.

2:40 **Use of Morlex Mesh ta Reinfarce Camplicated Hernios**
VINCENT L. REES, M.D.

3:30 **Optimal Management af the Strake Potient**
JAMES R. SWENSON, M.D.

4:00 **Physical Fitness and Rehabilitatian in Athletics**
FREDERICK L. BEHLING, M.D.

4:20 **Rehobilitative Pragroms far the Past-Injured and Past-Surgical Knee in Athletics**
FREDERICK L. BEHLING, M.D.

4:40 **On-the-Field Evoluation af Athletic Injuries: Which Ones Need Urgent Treatment?**
OLIVER B. JOHNSTON, M.D.
Panel Participants: FREDERICK L. BEHLING, M.D.; JOHN C. WORLEY, JR., M.D.; REED S. CLEGG, M.D.

SESSION B

2:00 **Use af the Newer Antibiatics in the Adult Papulatian**
THEODORE C. EICKHOFF, M.D.

3:45 **Use af the Newer Antibiatics in the Pediotric Age Graup**
FREDERICK F. BARRETT, M.D.

Friday Morning, September 11

8:30 **Registration**
Film—**The Hyperkinetic Child**

9:00 **Diabetic Retinopathy**
F. Temple Riekof, M.D.

9:20 **L-Dopa Treatment of Parkinsonism**
O. HOWARD REICHMAN, M.D.

9:40 **Diseases of Medical Progress—Revisited**
ROBERT H. MOSER, M.D.

11:10 **Today's Problems in Treatment of Carcinoma of the Breast**
CUSHMAN D. HAAGENSEN, M.D.

Friday Afternoon

12:15 **Luncheon Buffet—Population Control: Everyone's Task**
ALAN F. GUTTMACHER, M.D.

2:00 **Glomerulonephritis and the Nephritic Syndrome: New Concepts and New Approaches**
ROBERT L. VERNIER, M.D.

2:20 **Conception Control: Present and Future Methods**
ALAN F. GUTTMACHER, M.D.

2:40 **Maternal Mortality in the State of Utah During 1960-1970**
CARL M. WOOLSEY, M.D.

3:00 **Monitoring the Fetus in Labor**
ANTHON E. ANDERSON, III, M.D.

3:20 **Intensive Care of the Neonate**
AUGUST L. JUNG, M.D.

Guest Speakers

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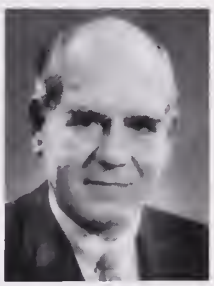

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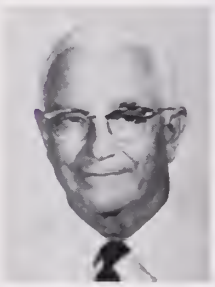

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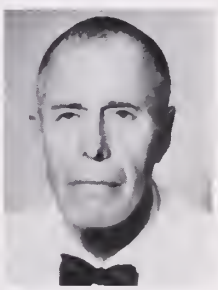

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100th ANNUAL SESSION
COLORADO MEDICAL SOCIETY

September 23-26, 1970

Broadmoor Hotel, Colorado Springs

House of Delegates Meetings

1:30 p.m.—Wednesday, September 23
Reference Committees will meet at 4:00 p.m.

1:30 p.m.—Friday, September 25

8:00 a.m.—Saturday, September 26

Recreational and Social Activities

Art and Hobby Show, September 23-26

Organized tournaments with trophies and prizes for the winners in Golf and Tennis.

Colorado Medical Society Centennial Banquet, Thursday, September 24

President's Reception, Thursday, September 24
Annual Colorado Medical Society "Oktaberfest," Friday, September 25

SCIENTIFIC PROGRAM

THURSDAY, September 24

8:30 a.m. **Health Hazards of Pollution**
ALTON OCHSNER, M.D.

10:30 a.m. **OUR POLLUTED WORLD**
Stemming the Tide of Increased Environmental Deterioration
DONALD L. DAHLSTEN, Ph.D.

Preventable Smog Disaster Over the Four Corners States
JOSEPH DEVANEY, Ph.D.

The Problem of Environmental Mercury Contamination
NEVILLE GRANT, M.D.

1:30 p.m. **Scientific Papers by Members of the Colorado Medical Society**

FRIDAY, September 25

9:00 a.m. **Medicolegal Problems as They Relate to Existing State Abortion Laws**

GEORGE E. HALL, J.D.

10:30 a.m. **Seminar on Present Day Status of Abortion**

Panelists: WILBUR F. MANLY, M.D.
CHARLES A. DAFOE, M.D.
STUART GOTTESFELD, M.D.
JAMES J. DELANEY, M.D.

SATURDAY, September 26

9:00 a.m. Guest Speaker:

MISS MERCEDES McCAMBRIDGE

10:30 a.m. **Seminar on Alcoholism and Drug Abuse**

Participants: DONALD E. COOK, M.D.
HENRY E. COOPER, M.D.
RICHARD W. REWEY, M.D.
JOHN E. OTT, M.D.
DANIEL T. TEITELBAUM, M.D.

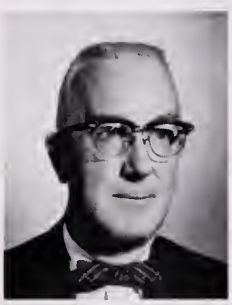
Guest Speakers

DONALD L. DAHLSTEN, Ph.D.
Associate Professor of Entomology and Parasitology, Division of Biological Control, University of California, Berkeley, California

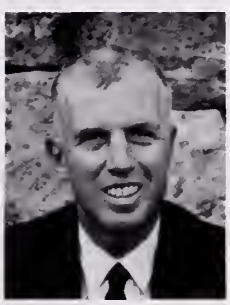
NEVILLE GRANT, M.D.
Asst. Professor of Clerical Medicine, Washington University School of Medicine, St. Louis, Missouri

MISS MERCEDES McCAMBRIDGE
Distinguished Actress of stage, motion pictures and radio

ALTON OCHSNER, M.D.
President, Alton Ochsner Medical Foundation, New Orleans, Louisiana



GEORGE E. HALL, J.D.
Assistant to the General Counsel, American Medical Association



JOSEPH J. DEVANEY, Ph.D.
Los Alamos Scientific Laboratory, Staff Physicist, Theoretical Division, Los Alamos, New Mexico

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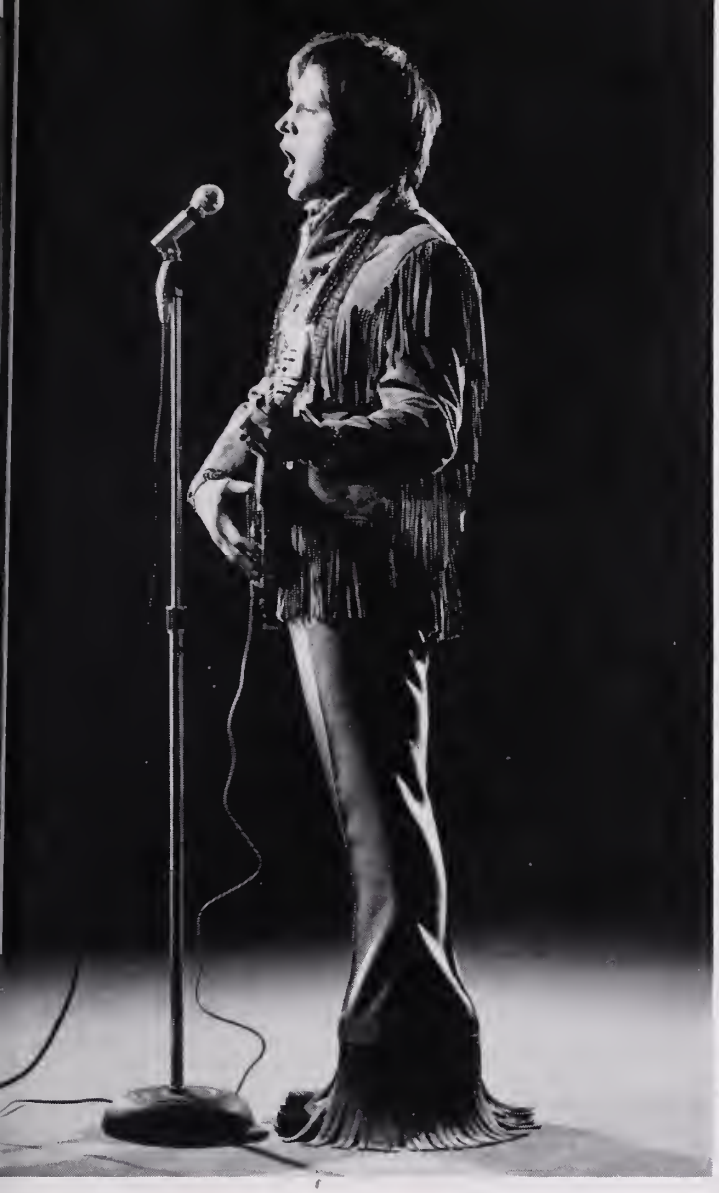

Picture of painful myositis

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Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility . . . stop pain-spasm feedback by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

Contraindications: Sensitivity to either component. ***Precautions:*** Exercise caution in patients with known allergies or history of drug allergies. If a sensitivity reaction or signs or symptoms suggestive of liver dysfunction are observed, the drug should be stopped. ***Adverse Reactions:*** Occasionally, drowsiness, dizziness, lightheadedness, malaise, overstimulation or gastrointestinal disturbances may be noted; rarely, allergic-type skin rashes, petechiae, ecchymoses, angioneurotic edema or anaphylactic reactions. In rare instances, *Paraflex* (chlorzoxazone) may possibly have been associated with gastrointestinal bleeding. While *Paraflex* (chlorzoxazone) and chlorzoxazone-containing products have been suspected as being the cause of hepatic toxicity in approximately eighteen patients, it was not possible to state that the dysfunction was or was not drug induced. ***Usual Adult Dosage:*** Two tablets q.i.d. ***Supplied:*** Scored, light green tablets, imprinted "McNEIL"—bottles of 100.

References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

McNEIL

McNEIL LABORATORIES, INC., FT. WASHINGTON, PA. 19034

*U.S. PATENT NO. 2,895,877

Sally Wilson has lost her reputation.

In the last week or so, Sally Wilson's year-old reputation as an unpredictable grouch has melted away.

She doesn't flare up and lash out at business or at home.

She's been coming in on time and turning out more work.

Sally's menopause had triggered symptoms that hormonal therapy by itself apparently hadn't helped.

Now there's been marked improvement since her physician put her on adjunctive Valium (diazepam) 5-mg tablets *q.i.d.*

Valium has helped her relax.

She's less tense and taut; she's more friendly and cheerful and wants to be part of her world.

The menopause may be associated with excessive psychic tension, agitation and depressive symptoms.

In such cases, Valium usually reduces the psychic tension and can encourage a more relaxed outlook, a healthier response to the stresses of everyday living, and help promote a sense of well-being.

Relieves psychic tension alone or associated with functional or organic disorders.

Calming effect usually prompt and pronounced.

Skeletal muscle-relaxant property enhances its value adjunctively in total management of selected patients.

On proper maintenance dosage seldom dulls the senses or interferes with function.

Generally well tolerated; most common side effects have been drowsiness, fatigue and ataxia.

No peripheral autonomic blocking effects and no extrapyramidal symptoms.

Flexible dosage—available as 2-mg, 5-mg, 10-mg tablets.

An *h.s.* dose added to *t.i.d.* dosage facilitates sleep in tension-induced insomnia.

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Tension and anxiety states; somatic complaints which are concomitants of emotional factors; psychoneurotic states manifested by tension, anxiety, apprehension, fatigue, depressive symptoms or agitation; acute agitation, tremor, delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in skeletal muscle spasm due to reflex spasm to local pathology, spasticity caused by upper motor neuron disorders, athetosis, stiff-man syndrome, convulsive disorders (not for sole therapy).

Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms have occurred following abrupt discontinuance. Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence. In pregnancy, lactation or women of childbearing age, weigh potential benefit against possible hazard.

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation, have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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Valium® (diazepam)

useful in psychoneurotic states manifested by psychic tension with associated depressive symptoms

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relieved with MEASURIN® q. 8h. dosage

Double-strength Measurin timed-release aspirin offers a new kind of control for your arthritic patients. Each 10-grain tablet has over 6,000 microscopic reservoirs that release aspirin at a controlled rate—some right away and some later on. This means—fast relief, followed by long lasting relief. Throughout the day, Measurin gives your patients freedom from a 4-hour dosage schedule. Measurin can help your patients get a good night's sleep, uninterrupted by the need for an extra dose of aspirin. And, taken at bedtime, it also helps ease morning joint discomfort and stiffness.

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MEASURIN®
TIMED-RELEASE ASPIRIN

ECONOMICAL • EFFECTIVE • LONG LASTING PAIN RELIEF
Dosage: 2 tablets followed by 1 or 2 tablets every 8 hours as required, not to exceed 6 tablets in 24 hours. For maximum nighttime pain relief and to help relieve early morning stiffness, 2 tablets at bedtime.
Available: Bottles of 12, 36 and 60 tablets.

"When I prescribe medicines, I must be certain I'm right!"

A family doctor discusses the question of quality drugs.

In my practice of medicine, my first obligation is to my patients. When I prescribe a drug product, my purpose is to select a drug that will help the patient and do the job that I want it to do. I expect it to be of correct potency, accurate in dosage, with the precise amount of active ingredient, to be absorbed by the body at the proper time.

My feeling is that when I order a drug and I specify the precise product I want, I can control what my patients are going to get.

For their welfare and my own sense of security, I go with the drug products that experience has shown me work well. They may be brand name drugs . . . or they may be quality medicinals sold by their generic names. But they must be drugs that have proved they will do the job. I want to know their source and the reputation of the manufacturer. This freedom of choice should be mine, based on my knowledge and experience. With the potency of today's drugs, I don't know any safe ways to cut corners.

Another point of view . . .

Pharmaceutical Manufacturers Association, 1155 Fifteenth St., N.W., Washington, D.C. 20005

This advertisement has been reaching consumers through: The Atlantic, Family Health, Harpers, Newsweek, Saturday Review, Times & U.S. News and World Report

Equipped for the thyroid emergency?

When an ambulance arrives with the unexpected patient presenting the classical picture of myxedema coma, is your hospital suitably equipped? It is if SYNTHROID® (sodium levothyroxine) injectable is at hand. You are also ready to conveniently handle post-operative thyroid medication situations until oral therapy can be reinstated.

In tablet form this single entity synthetic thyroid provides smooth, predictable response for thyroid replacement. An excellent drug for long-term therapy.

But in an emergency, when rapid replacement is needed to sustain life, prompt clinical response is essential. SYNTHROID injection makes this therapy instantly available. Is it available in your hospital?

Levothyroxine has a high binding capacity for serum proteins in cantrast ta ather thyroid medicaments that may cantain a thyraactive agent with low binding capacity. *The bound levothyroxine is totally measurable using the serum PBI test. It is not unusual ta find PBI levels af 8-10 mcg. per 100 ml. of serum.*

INDICATIONS: SYNTHROID (sodium levothyroxine) INJECTION is specific replacement therapy for diminished ar absent thyroid function resulting from primary or secondary atrophy of the gland, cangenital defect, surgery, excessive radiation, ar antithyraid drugs. It is indicated in myxedematous coma and other thyraid dysfunctions where rapid replacement af the harmone is required. When a patient daes not respond to oral therapy, SNYTHROID (sodium levathyroxine) INJECTION may be administered intravenously.

PRECAUTIONS: As with other thyroid preparations, averdase may cause diarrhea or cramps, nervausness, tremors, tachycardia, insamnia and continued weight lass. These effects may became apparent in from 4 days ta three weeks. Therefore, patients shauld be kept under close observatian. Medicatian, in such cases, should be stapped far 2 ta 6 days, then resumed at a lower level. In patients with diabetes mellitus, look for possible changes in metabolic activity which may affect insulin or ather antidiabetic drug dasage requirements.

CONTRAINDICATIONS: Thyrotoxicosis, acute myocardial infarction.

SIDE EFFECTS: Side effects are secondary to increased rates of body metabalism: sweating, heart palpitations with or without pain, leg cramps, weight loss, diarrhea, vomiting and nervousness. Myxedematous patients with heart disease have died fram abrupt increases in dasage af thyraid drugs. In mast cases, a reductian in dasage fallawed by a more gradual adjustment upward will indicate the patient's dasage requirements without the appearance af side effects.

DOSAGE AND ADMINISTRATION: In myxedematous stupor or coma, with no evidence af severe heart disease, 200 to 400 mcg. of SYNTHROID (sodium levothyroxine) INJECTION may be administered intravenausly utilizing a solutian cantaining 100 mcg. per ml. Detectable effects are usually abserved by the sixth haur after injectian and are fully appreciated during the follawing day. A repeat injectian af 100 to 200 mcg. may be given on the secand day if significant improvement has not accurred. The intravenous use of sodium levothyraxine in myxedematous coma is advantageous because it produces a predictable increase in the concentratian af protein-bound iadine, eliminates the need for multiple dases until oral therapy is reinstated, circumvents the uncertainty af oral absorptian, and avaids the risk of pulmonary aspiration.

SUPPLIED: SYNTHROID (sodium levathyroxine) INJECTION is supplied in 10 ml. vials containing 500 mcg. of lyaphilized active ingredient and 10 mg. of Mannitol, N.F.; a 5 ml. vial cantaining Sodium Chloride Injection, U.S.P. is pravided as diluent.

Alsa supplied as SYNTHROID (sadium levathyroxine) TABLET in color caded compressed tablets, and in seven strengths: 0.025 mg. (arange), 0.05 mg. (white), 0.1 mg. (yellaw), 0.15 mg. (vialet), 0.2 mg. (pink), 0.3 mg. (green), and 0.5 mg. (blue). Each strength is supplied in battles af 100 and 500 tablets.

Synthroid®
(sodium levothyroxine, FLINT)
Injection

FLINT LABORATORIES
DIVISION OF TRAVENOL LABORATORIES, INC.
Morton Grove, Illinois

The girth control pill

Tepanil® Ten-tab

(continuous release form)

(diethylpropion hydrochloride)

works on the appetite not on the 'nerves'

When girth gets out of control, TEPANIL can provide sound support for the weight control program you recommend. TEPANIL reduces the appetite—patients enjoy food but eat less. Weight loss is significant—gradual—yet there is a relatively low incidence of CNS stimulation.

Contraindications: Concurrently with MAO inhibitors, in patients hypersensitive to this drug; in emotionally unstable patients susceptible to drug abuse.

Warning: Although generally safer than the amphetamines, use with great caution in patients with severe hypertension or severe cardiovascular disease. Do not use during first trimester of pregnancy unless potential benefits outweigh potential risks.

Adverse Reactions: Rarely severe enough to require discontinuation of therapy, unpleasant symptoms with diethylpropion hydrochloride have been reported to occur in relatively low incidence. As is characteristic of sympathomimetic agents, it may occasionally cause CNS effects such as insomnia, nervousness, dizziness, anxiety, and jitteriness. In contrast, CNS depression has been reported. In a few epileptics an increase in convulsive episodes has been reported. Sympathomimetic cardiovascular effects reported include ones such as tachycardia, precordial pain, arrhythmia, palpitation, and increased blood pressure. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride; this was an isolated experience, which has not been reported by others. Allergic phenomena reported include such conditions as rash, urticaria, ecchymosis, and erythema. Gastrointestinal effects such as diarrhea, constipation, nausea, vomiting, and abdominal discomfort have been reported. Specific reports on the hematopoietic system include two each of bone marrow depression, agranulocytosis, and leukopenia. A variety of miscellaneous adverse reactions have been reported by physicians. These include complaints such as dry mouth, headache, dyspnea, menstrual upset, hair loss, muscle pain, decreased libido, dysuria, and polyuria.

Convenience of two dosage forms: TEPANIL Ten-tab tablets: One 75 mg. tablet daily, swallowed whole, in midmorning (10 a.m.); TEPANIL: One 25 mg. tablet three times daily, one hour before meals. If desired, an additional tablet may be given in midevening to overcome night hunger. Use in children under 12 years of age is not recommended.

T-006A / 1/70 / U S. PATENT NO. 3,001,910

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144

Painful night leg cramps...

unwelcome bedfellow for any patient– including those with arthritis, diabetes or PVD

One thing patients can sleep without, particularly patients with chronic disease conditions such as arthritis, diabetes or PVD, is painful night leg cramps. Although seldom the presenting complaint, night leg cramps can tie your patients up in painful knots. Now, just one tablet of QUINAMM at bedtime can usually bring an end to shattered sleep and needless suffering. Your patients will sleep restfully—gratefully—with QUINAMM, specific therapy to prevent painful night leg cramps.

Prescribing Information—Composition: Each white, beveled, compressed tablet contains: Quinine sulfate, 260 mg., Aminophylline, 195 mg. **Indications:** For the prevention and treatment of nocturnal and recumbency leg muscle cramps, including those associated with arthritis, diabetes, varicose veins, thrombophlebitis, arteriosclerosis and static foot deformities. **Contraindications:** QUINAMM is contraindicated in pregnancy because of its quinine content. **Precautions/Adverse Reactions:** Aminophylline may produce intestinal cramps in some instances, and quinine may produce symptoms of cinchonism, such as tinnitus, dizziness, and gastrointestinal disturbance. Discontinue use if ringing in the ears, deafness, skin rash, or visual disturbances occur. **Dosage:** One tablet upon retiring. Where necessary, dosage may be increased to one tablet following the evening meal and one tablet upon retiring. **Supplied:** Bottles of 100 and 500 tablets.

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
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Quinamm™
(quinine sulfate 260 mg., ominophylline 195 mg.)

Specific therapy for night leg cramps

Schering

After only one year:

Administered to more people than live in Boulder, Ogden, Butte, and Santa Fe:*

Injectable
Garamycin®
brand of
gentamicin sulfate
injection

*An estimated 208,000 patients have received GARAMYCIN Injectable to date. The combined population of Boulder, Ogden, Butte, and Santa Fe is 200,000. (Estimated 1969 figures from The New York Times Encyclopedic Almanac 1970.)

See Clinical Considerations section on last page...

Injectable Garamycin®
brand of gentamicin sulfate injection

Schering

ADULT DOSAGE GUIDELINES

See definitive prescribing information in Package Insert.

Patients with Normal Renal Function

Total Daily Dose (administered in two, three, or four divided doses)			
Urinary Tract Infections (due to susceptible strains of gram-negative bacteria)†	Less Severe 0.8-1.2 mg./kg. for 7-10 days	Resistant/ Moderately Severe Larger doses or additional antibacterial therapy should be considered in severe urinary tract infections or in resistant cases involving the renal parenchyma or anatomic anomaly.	Serious/Life-Threatening up to 5 mg./kg.
Other Infections including bacteremia, infected surgical wounds, severe soft tissue infections, and respiratory tract infections (due to susceptible strains of gram-negative bacteria)	3 mg./kg. for 7-10 days		

†Alkalinization of the urine may be a useful therapeutic adjunct.

Patients with Impaired Renal Function

To minimize the risk of ototoxicity in patients with impaired kidney function, only the first dose should be that normally recommended. Each subsequent dose should be half or less of that recommended for patients with normal renal function, depending upon the degree of renal impairment.

In patients with renal failure who are undergoing 14-hour hemodialysis twice weekly, administration of 1 mg./kg. GARAMYCIN Injectable at the end of each dialysis period has been suggested.

Clinical Considerations

Indications: GARAMYCIN Injectable is clinically effective in infections due to susceptible strains of gram-negative bacteria, including *Pseudomonas aeruginosa,* and species of indole-positive and indole-negative *Proteus, Escherichia coli,* and *Klebsiella-Aerobacter.* Bacteriologic studies should be conducted to identify the causative organism and to determine its sensitivity to gentamicin sulfate. Sensitivity discs of the drug are available for this purpose. If the susceptibility tests indicate that the causative organism is resistant to gentamicin sulfate, other appropriate antibiotic therapy should be instituted.

IN VITRO INHIBITION OF CLINICALLY IMPORTANT BACTERIA BY GENTAMICIN SULFATE (TUBE DILUTION STUDIES)

BACTERIA	No. of Strains Tested	No. of Strains (%) Inhibited by: 4 mcg./cc. or less		8 mcg./cc. or less*		No. of *In Vitro* Studies
Staphylococcus aureus	1,210	1,200	(99%)	1,206	(99%)	11
Pseudomonas aeruginosa	885	771	(87%)	828	(93%)	16
Escherichia coli	836	736	(88%)	779	(93%)	11
Indole-positive and indole-negative *Proteus* species	477	210	(44%)	358	(75%)	12
Klebsiella-Aerobacter species	292	205	(70%)	231	(79%)	10

*Number of strains (%) of gram-negative bacteria inhibited by 10 mcg./cc. or less are as follows: *Pseudomonas aeruginosa,* 828 (93%); *Escherichia coli,* 792 (95%); *Proteus* species, 393 (82%); *Klebsiella-Aerobacter* species, 284 (97%). From same studies as above.
Source: Package Insert

This drug should be limited to the treatment of serious infections caused by gram-negative bacteria, particularly *Pseudomonas aeruginosa, Proteus* and other susceptible organisms, with due regard for relative antibiotic toxicity. Therefore, the drug should be considered for use against gram-negative: 1. Bacteremia; 2. Infected surgical wounds; 3. Severe soft tissue infections, including burns complicated by sepsis; 4. Respiratory tract infections; and 5. Selected cases of urinary tract infection.

Contraindications: GARAMYCIN Injectable is contraindicated in individuals with a history of hypersensitivity or toxic reactions to gentamicin.

Warnings: Patients receiving treatment with GARAMYCIN should be under close clinical observation because of the toxicity associated with the use of this drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those with pre-existing renal damage, treated with GARAMYCIN Injectable, usually for longer periods or with higher doses than recommended.

GARAMYCIN Injectable is potentially nephrotoxic, and this should be kept in mind when it is used in patients with pre-existing renal impairment. Kidney function diminished by infection of the upper urinary tract may, however, improve during effective treatment with GARAMYCIN Injectable.

Concurrent administration of potentially ototoxic drugs such as streptomycin and kanamycin or of potentially nephrotoxic drugs such as polymyxin, colistin, and kanamycin with gentamicin sulfate has not been shown to afford any clinical advantages and, moreover may result in additive toxicity. Monitoring of vestibular, cochlear, and renal function will provide guidance for therapy in such cases.

Precautions: In patients with impaired renal function in whom serious infection develops, serum concentrations of the drug may rise, with consequently increased risk of ototoxicity. In these patients or in those in whom recommended dosage or duration of therapy must be exceeded as a life-saving measure, routine studies of kidney function should be performed when possible. These may be supplemented by evaluation of the vestibular and auditory function and measurement of serum concentration of the drug when feasible. Serum concentrations of gentamicin should be maintained below the range of 10-12 mcg./ml. to reduce risk of ototoxicity.

Ordinarily, treatment should not be given for more than 7 to 10 days or be repeated unless required for serious infection not responsive to other agents.

As with other antibiotics, treatment with GARAMYCIN Injectable may occasionally result in overgrowth of nonsensitive organisms. If superinfection occurs, appropriate therapy is indicated.

Safety for use in pregnancy or the potential for fetal ototoxicity or nephrotoxicity have not been established. Studies in pregnant animals have not revealed teratogenic or ototoxic effects in the fetus. GARAMYCIN Injectable should not be used in pregnant patients or in women of childbearing age unless its use is deemed advisable by the physician.

Adverse Reactions: The overall incidence of ototoxicity considered related to treatment with GARAMYCIN Injectable was 2.8 per cent (16 of 565 patients). Contributory factors (two or more factors were relevant to most patients) were as follows: 10 had azotemia, 10 received a total of 1 gram or more of the drug, 7 had recently received other potentially ototoxic antibiotics (streptomycin or kanamycin), and 5 were over 60 years of age. Six also had decreased high-tone hearing acuity, which returned to or toward normal in the 4 patients retested.

Analysis of BUN data indicated that 4 (2%) of 172 patients showed increases in BUN that were probably related to treatment with GARAMYCIN Injectable. Of 20 increases probably or possibly related to treatment, 7 were reversible, 9 occurred in terminal patients, and 4 had no follow-up.

Other adverse reactions associated with treatment were one instance each of urticaria, decreased hematocrit, and reversible depression of granulocytes with normal bone marrow. Other rarely reported and possibly treatment-related adverse reactions were anemia, increased reticulocyte count, rash, purpura, drug fever, hypotension, convulsions, twitching, salivation, nausea, vomiting, increased transaminase activity (SGOT or SGPT), increased serum bilirubin, decreased serum calcium, and joint pain.

Packaging: GARAMYCIN Injectable, 40 mg./cc., 2-cc. multiple-dose vials, for intramuscular administration.

For more complete prescribing details, consult package insert or Physicians' Desk Reference. Schering literature is also available from your Schering Representative or Medical Services Department, Schering Corporation, Union, New Jersey 07083.

AHFS CATEGORY 8:12.28 S-029

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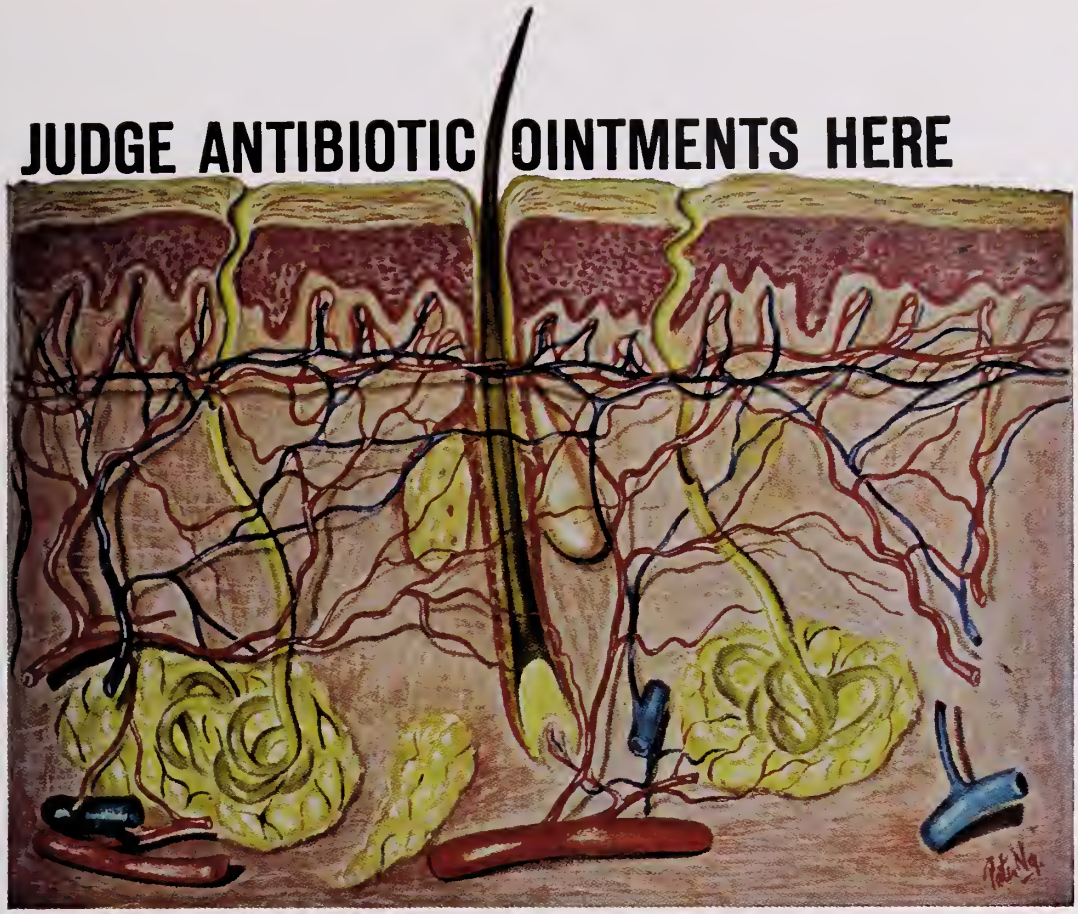

Results on skin are final proof of any topical antibiotic's effectiveness

No in vitro test can duplicate a clinical situation on living skin. 'Neosporin' (polymyxin B—bacitracin—neomycin) Ointment has consistently proven its effectiveness in thousands of cases of bacterial skin infection. The spectra of the three antibiotics overlap in such a way as to provide bactericidal action against most pathogenic bacteria likely to be found topically. Diffusion of the antibiotics from the special petrolatum base is rapid since they are insoluble in the petrolatum, but readily soluble in tissue fluids. The Ointment is bland and nonirritating.

Caution: As with other antibiotic preparations, prolonged use may result in overgrowth of nonsusceptible organisms and/or fungi. Appropriate measures should be taken if this occurs. Articles in the current medical literature indicate an increase in the prevalence of persons allergic to neomycin. The possibility of such a reaction should be borne in mind.

Contraindications: This product is contraindicated in those individuals who have shown hypersensitivity to any of its components.

Supplied: Tubes of 1 oz., ½ oz. with applicator tip, and ⅛ oz. with ophthalmic tip.

Complete literature available on request from Professional Services Dept. PML.

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Lilly

Another Western President for the AMA!

For the second time in recent history, our Mountain States will have another President of the AMA. The last previous one was Dr. George M. Fister of Ogden, Utah, whose term was 1962-63. And then in 1970 we had two candidates for President-Elect, Dr. Irvin Hendryson, formerly of Denver and now of Albuquerque, and Wesley W. Hall of Reno. Thus, we felt that we couldn't miss—and we didn't! Wesley Hall won out, and we take this opportunity to pay tribute to our colleague who so richly deserves this number one position in the world of American medicine. He was elected to the AMA Board of Trustees in 1961 and is now finishing his maximum tenure of nine years. Previously, from 1952, he had been Nevada's delegate to the AMA House of Delegates. Time and space do not permit a listing of his innumerable accomplishments and public services. He represents the sixth generation of medical men in the Hall family, dating back to Dr. Lyman Hall, a member of the Continental Congress, a signer of the Declaration of Independence, and subsequently the first Governor of Georgia. The seventh generation is represented by Dr. Wesley W. Hall, Jr., now finishing a residency in surgery at the University of Colorado School of Medicine and Colorado General Hospital. Dr. Hall has been Secretary-Treasurer and President of the Nevada State Medical Association and is a member of leading surgical organizations. As a distinguished citizen he has served as physician and referee in high school and college athletics. He has presented over 1,200 programs to medical organizations of national, state and local levels, and to service clubs and civic organizations. He is a prominent Rotarian, Mason, and churchman. In addition to Wesley, Jr., another son will enter the University of Oregon Medical School this fall; three daughters have distinguished themselves in fields of education, and as citizens after having been honor students, as was their mother.

Wesley Hall has been a leader and a champion of AMPAC and NEMPAC; every candidate for public office friendly to AMA has had an active and vociferous supporter in Wesley Hall. Likewise, he has appeared before the legislature on behalf of health legislation. It has been said and repeated that his integrity has never been questioned nor has his courage. We are proud that such a man agreed to be a candidate for President-Elect of AMA and we look forward to the power of his personality and ability at the helm of our parent organization. No man in our generation could have a better background nor more creditably distinguished himself during the long "training period" to serve the American Medical Association.

Inflation and the Vanishing Volunteer

Been on a Nominating Committee lately? Or as Chief of Staff, have you recruited enthusiastic Chairmen for committee work? Federal rollback of medical fees (to soften slightly the total health-care cost escalation) when, added to inflation, has many repercussions. One fallout increasingly evident at the front lines of medical care (but not yet apparent to social planners at the seat of government) is the *time erosion syndrome.*

Caught between the exploding cost of doing business and third-party fee-fixing, the private physician has only the alternative of greater volume (and efficiency) if he is to run enough faster to stay where he was. If quality is to be maintained, then increased volume must be purchased with time and ruthless efficiency.

From whence comes the extra practice time to balance increased costs and fixed

fees? Little more can be exacted from the physician's already shriveled time allotment for family—and his fabled Wednesday Afternoon-on-the-Golf-Course has little reality for most. It follows that time once freely spent in volunteer teaching, hospital and organizational committee work is running out.

Social planners remote from the patient-doctor interface seem generous in volunteering the doctors' time for peer review and accreditation chores. Like the Pentagon, they are not yet aware of my colleagues' rush to achieve Emeritus or Honorary hospital staff status as sanctuary from organizational assignments. This crush can be best observed in the metropolitan setting among physicians with multiple staff affiliations and overlapping professional memberships. Being President of one (let alone Secretary!) is fast becoming as much an honor as an inadvertent pregnancy on a people-polluted planet. Equally disastrous honors may be one's assignment to peer-review, utilization control, or grievance posses, and to volunteer teaching of paramedical trainees.

The solution is as obvious as the one for saving Southeast Asia. Still, the rational search for a *method* toward some solution seems to demand that effective planning must evolve from the field of battle, not from the sanctuary of ivory towers; that those who devise more tasks must volunteer the *WORK* or manpower—not just volunteer the other fellows' time.

How? Unfortunately, time and space does not permit an answer here but . . . . . .

Clyde Stanfield, MD

Charnley total hip arthroplasty - -

*A preliminary report**

J. Phillip Nelson, MD, Richard D. Talbott, MD, and Alba R. Glassburn, Jr., MD, Denver

DEGENERATIVE ARTHRITIS of the hip produces pain and disability of varying degrees which usually progress in severity with time. It may be caused by congenital hip dysplasia, trauma, rheumatoid or infectious arthritis, or a variety of metabolic, endocrine, and growth disturbances. More commonly, the cause is obscure. Nonoperative treatment consists of analgesics, physical medicine measures, and external support. A variety of operative technics for treatment of this condition have been developed, including arthrodesis, osteotomy, arthroplasty (cup or prosthetic) and myotomy. These procedures still have a place in the surgical treatment of degenerative arthritis of the hip, and proper indications for their use are now rather firmly established. However, only solid arthrodesis assures a stable, pain-free hip, and it has obvious disadvantages in terms of the patient's function and appearance. The other procedures which preserve motion relieve pain in 60 to 80 per cent of cases.

It was with these facts in mind that Mr. John Charnley of Manchester, England developed the low friction or total hip arthoplasty[1,2] in 1958. The principles upon which this procedure is based are the following:
(1) Replacement of the diseased acetabular and femoral portions of the hip by nonreactive metal and plastic components to the Rigid fixation of these components to the pelvis and femoral shaft with a rapidly self-curing plastic polymer. These principles and the components now in use were derived from extensive basic research into the mechanics of a variety of materials and joints with special emphasis on wear and biologic characteristics of the materials.[3] The components of the Charnley hip joint in their present form are: (1) A femoral prosthesis of highly machined stainless steel which is noteworthy because of its small, highly polished head which reduces friction. (2) An acetabular prosthesis made of high density polyethylene. (3) Bone cement or rapidly self-curing polymethylmethacrylate.

The wear of the joint under normal conditions of human use has been estimated at 1 millimeter every 5 years. Since the cup is 13 millimeters thick, it can be seen that long functional life of the system can be expected. To date, there have been no adverse biologic reactions in humans related directly to the use of bone cement except for a transient, minimal, inconstant fall in blood pressure at the time of its insertion.[3] Polymethylmethacrylate has been used by neurosurgeons for cranioplasties and by dentists in prosthetics for 25 years with no reported adverse biologic reactions. Because of the remote possibility of such reactions many years following its implantations, total hip arthroplasty is usually not recommended in persons under age 50.

*From the Department of Graduate Medical Education, St. Luke's Hospital, Denver.

In order to perform this procedure in this country, an investigational number signifying approval from the United States Food and Drug Administration is necessary because the polymethylmethacrylate is classified as an investigational drug. Charnley has performed more than 3,000 total hip arthroplasties, and there are at present approximately 20 centers in the United States licensed to use polymethylmethacrylate in joint reconstruction. As noted above, no significant untoward reactions attributable to the "bone cement" have been reported. A second condition required in the performance of this procedure is personal instruction in technic by Mr. Charnley, who permits distribution of the hip components and instruments necessary to perform the procedure only to those who have been so instructed.

The reported early and late results in terms of pain relief and preservation of motion are very encouraging. Approximately 90 to 95 per cent of those patients who have had this operation report relief of most if not all preoperative pain.[4,5,6] They require no analgesics and the majority have been able to discard external supports. Most patients report markedly increased strength and endurance.

The most serious potential complication is infection, which is reported to occur in 0.5 to 4.0 per cent of cases. Every known measure to prevent infection is taken. Other complications include a 1.0 per cent dislocation rate in the immediate postoperative period, and the usual postoperative venous, pulmonary, and urinary problems which may occur following any major operative procedure.

Our group has performed 34 total hip arthroplasties between November 1, 1969, and April 20, 1970. We have been encouraged by the early results from these operations in terms of relief and increased motion. Ambulation is begun approximately seven days following surgery. The average hospital stay is less than three weeks. Following dismissal from the hospital, the patient is followed at frequent intervals as an outpatient.

Our complications have included one death of cause unrelated specifically to this particular procedure, one infection in a very obese patient who eventually expired, one wound hematoma secondary to anticoagulants, and one patient with pulmonary emboli. An early prosthesis dislocation was managed successfully with closed reduction.

Summary

The Charnley total hip arthroplasty is now available to patients with severe degenerative arthritis of the hip. The reported results and our own early experience with this procedure are encouraging. •

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MEDICAL CONFERENCE
from the
UNIVERSITY OF NEW MEXICO SCHOOL OF MEDICINE

Lymphoma

PRESENTATION: Allen Wilson, MS-4

DISCUSSION: William R. Hardy, MD, Associate Professor, Departments of Medicine and Pathology

CASE PRESENTATION

Mr. Wilson: The patient is a 42-year-old Jemez Indian heavy equipment operator who was well until February 1969 when he had the onset of hoarseness, sore throat, and nasal discharge. These symptoms persisted and approximately two weeks later he noted onset of fever, chills, and profound weakness. Over the next few days he developed anorexia, nausea, vomiting, abdominal distention and diarrhea. He was admitted to the Bernalillo County Medical Center in early March, 1969. History indicated that his father had been treated for pulmonary tuberculosis. On admission he appeared acutely ill. Temperature: 102.6° F; blood pressure: 130/75; pulse: 96 per minute. Pertinent physical findings included massive bilateral cervical lymphadenopathy nodes varied from 1-4 cm in diameter) as well as significant lymphoadenopathy in the axillary, epithrochlear and inguinal-femoral areas. His throat was extremely inflammed, but without exudate. Inflammation of the right external auditory canal was noted. The abdomen was distended and diffusely tender. No fluid wave could be demonstrated. The liver edge was palpable 9 cm below the right costal margin and the spleen extended 3 cm below the left costal margin. At the time of admission the following laboratory data were obtained:

Hematocrit	43%
Hemoglobin	13.8 gm%
White count with 51% segmented neutrophils, 1% band neutrophils, 35% lymphocytes, 2% eosinophils, and 1% monocytes	24,000/mm³
Blood film revealed prominent rouleaux formation. Many of the lymphocytes were atypical.	
Urinalysis	Normal
Serum alkaline phosphatase	76 1U
Total serum protein	8.2 gm%
Serum protein electrophoresis revealed a polyclonal increase in the gamma fraction (38%): Gamma G=4200 mgm%; Gamma A; 290 mgm%; Gamma M=240 mgm%.	
The following blood studies were within normal limits: BUN, fasting blood sugar, potassium, chloride, calcium, phosphorus, uric acid, prothrombin time, and partial thromboplastin time.	

*Prepared by William S. Curran, MD, Assistant Scientific Editor for New Mexico, Albuquerque, New, Mexico.

Febrile agglutinins were negative except for a parathyphoid A titer of 1:160. Throat cultures revealed the presence of beta hemolytic streptococcus; stool culture revealed Shigella flexneri. Additional cultures of sputum, bone marrow, and lymph node material were all negative. Chest x-ray revealed enlargement of the mediastinal lymph nodes; an intravenous pylogram revealed medial deviation of both ureters, thought to be due to retroperitoneal lymphadenopathy. X-ray of the upper gastrointestinal tract demonstrated compression of the second and third parts of the duodenum with almost complete obstruction at that level. Biopsies were obtained of lymph nodes from the right cervical and left axillary areas. Histology revealed almost complete loss of architecture with numerous reticulum cells, lymphocytes, plasma cells and segmented neutrophils. Mitotic figures were numerous. These changes were interpreted as indicative of a reactive lymphadenitis of undetermined etiology. Bone marrow aspiration and needle biopsy revealed a hypercellular specimen with an M/E ratio of 8/1. Hyperplasia of the granulocytic, plasmacytic, and reticuloendothelial cell lines was noted. There were no changes suggestive of marrow infiltration or granuloma formation. Skin tests for systemic fungi, tuberculosis, and mumps were all negative.

Treatment with penicillin and ampicillin was followed by disappearance of his pharyngeal and abdominal symptoms. Although he improved somewhat clinically, his temperature continued to spike as high as 103° F.

He was transferred to the Veterans Administration Hospital in the latter part of April, 1969. At the time of transfer he was noted to have persistence of lymphadenopathy, hepatosplenomegaly, and fever. In addition, he had developed swelling and tenderness of the right knee and had lost 10 lbs. Shortly after transfer, he was put on indomethacin 50 mg TID. This was followed by prompt disappearance of his fever. A repeat lymph node biopsy from the left supraclavicular area was obtained. Histologic findings were not greatly changed, although at this time typical Reed-Sternberg cells could be identified. The tissue was felt to be diagnostic of Hodgkin's disease, mixed cellularity type. Laboratory findings at this time were not significantly changed. Serologic test for the presence of rheumatoid factor was positive. Therapy with cylophosphamide, vincristine, and prednisone was initiated. Over the next 7-10 days he had notable regression in his lymphadenopathy and hepatosplenomegaly. His appetite improved and he had a return of a feeling of well-being. He was able to be discharged for out-patient follow-up. Since discharge he has developed joint tenderness and swelling of both wrists plus several of the proximal interphalangeal joints with synovial thickening. He continues otherwise to enjoy general good health.

DISCUSSION

Dr. Hardy: The discussion this morning will deal rather briefly with this patient's problems and at greater length with selected aspects concerning the lymphomas — their definition and classification, clinical staging, and certain concepts which are important in management.

We have been presented with a man who, during the past year, has had an illness characterized initially by upper respiratory and gastrointestinal symptoms associated with fever and chills. In addition, he exhibited striking hepatosplenomegaly and generalized lymphadenopathy. Initially, he was found to have evidence of at least two diseases—beta hemolytic streptococcal pharyngitis and shigellosis. Neither of these disorders appeared to explain his lymphoreticular findings. His course was also complicated by the development of arthritis which evidence suggests is rheumatoid. Although lymphadenopathy and/or splenomegaly is a common finding in rheumatoid arthritis and the lymph nodes may occasionally reach 3 cm in diameter, the occurrence of joint manifestations after the onset of his lymph node enlargement casts doubt on this as a possible cause.[1] Establishment of a specific etiology for his lymphoreticular disease was somewhat delayed by the failure to find diagnostic features on the initial biopsy. Although this failure is often the result of poor surgical selection and/or improper processing of the lymph nodes, such did not seem to be the case here. Others have also encountered a

situation in which repeated biopsy was necessary before histologic evidence of lymphoma could be obtained. Saltzstein[2] observed that less than one-half of 68 patients in whom biopsy of enlarged nodes was performed for diagnosis were found to have diagnostic changes on microscopic examination. Of those who lacked diagnostic findings on initial biopsy, nearly 20 per cent developed and/or were found to have features diagnostic of lymphoma on repeat biopsy.

When we consider the conditions included under the designation of malignant lymphoma, we are principally dealing with three disorders: Hodgkin's disease, lymphosarcoma and reticulum cell sarcoma. Approximately 50 per cent of the lymphomas seen in the United States are Hodgkin's disease, about 30 per cent lymphosarcoma and 20 per cent reticulum cell sarcoma. There is some merit in understanding the histologic definition and subclassification of these disorders because the histology has important implications concerning treatment and prognosis. Until recently Hodgkin's disease was classified histologically according to the scheme of Jackson and Parker.[3] They described three histologic types: (1) paragranuloma, a form usually associated with a long survival, (2) granuloma, a histologic category in which there was a great degree of heterogeneity in both the cellular composition and prognosis, and (3) sarcoma, a form which was typically associated with a short survival. The major limitation to the Jackson and Parker classification is that only about 10 per cent of patients with Hodgkin's disease exhibit the paragranuloma or sarcoma form, so that histology contributed prognostic information in only a fraction of cases.

In 1966 a new histologic classification of Hodgkin's disease was proposed by Lukes and Butler.[4] This classification was subsequently modified at the Rye Conference[5] by a group of pathologists with major interests in this area. The classification has gained general acceptance. There are four histologic categories under this scheme: (1) lymphocyte predominance, (2) mixed cellularity, (3) lymphocyte depletion, and (4) nodular sclerosis. In the lymphocyte predominant form, the dominant cell is the lymphocyte although a histiocytic proliferation of variable degree may also be found. Reed-Sternberg cells, which are the sine qua non of Hodgkin's disease, are few in number. In the mixed cellularity group, the histologic response is intermediate between the lympocyte predominant and the lymphocyte depletion forms. A wide variety of histologic components (lymphocytes, eosinophils, neutrophils, plasma cells, histiocytes, Reed-Sternberg cells and fibrotic tissue) are found, often rendering distinction from a reactive lymphadenitis difficult. In the lymphocyte depletion group, lymphocytes are scant. Reed-Sternberg cells more numerous and often atypical in appearance, and fibrosis is often significant. The nodular sclerosing form is characterized by dense collagenous bands and cytoplasmic or "lacunar" Reed-Sternberg cells. Nodular sclerosis may be further subdivided according to the cellular composition between the collagenous bands (i.e., lymphocyte predominance, mixed cellularity or lymphocyte depletion). This form appears to be a regional manifestation of Hodgkin's disease in that it tends to be found almost exclusively in individuals who have involvement of the mediastinum and/or of the cervical nodes. For reasons unknown, nodular sclerosis is twice as common in females as males (although Hodgkin's disease in general is more frequent in males) and rarely disseminates to extranodal sites.

Biologically, the lymphocyte predominant pattern is usually a benign form and is associated with a long survival; mixed cellularity exhibits considerable variability in its aggressiveness and prognosis; and the lymphocyte depletion variety is typically associated with aggressive disease and short survival. Nodular sclerosis usually shows slow dissemination and is associated with relatively long survival. The frequency of these histologic groups can be summarized as follows: about 50 per cent exhibit the nodular sclerosing pattern, 5 per cent lymphocyte predominance, 5 per cent lymphocyte depletion, and 40 per cent mixed cellularity. Thus this histologic classification yields considerable information concerning biologic behavior and prognosis. As we shall see, the histologic picture also correlates with the clinical extent or stage of the disease.

Lymphosarcoma may be subdivided into two histologic subgroups: (1) lymphocytic or small cell lymphosarcoma and (2) lymphoblastic or large cell lymphosarcoma. Many authorities believe that the small cell form is a tissue analogue of chronic lymphocytic leukemia and that the large cell variety represents an analogue of acute lymphoblastic leukemia. This belief is based on the apparent identity of cell types involved in each of these disorders as well as on similar biologic behavior and prognosis. Finally, in Hodgkin's disease, lymphosarcoma and reticulum cell sarcoma, the histologic pattern may be nodular (architecture of the node preserved) or diffuse (architecture destroyed). These two patterns also have prognostic implications. In those individuals who demonstrate a nodular pattern the disease tends to be biologically less aggressive and to be associated with a longer survival than those with a diffuse histologic pattern.

Clinically, the initial manifestations in Hodgkin's disease, lymphosarcoma and reticulum cell sarcoma are almost always related to lymph node enlargement. Presentation with manifestations of extranodal involvement is uncommon. The lymph node involvement in the lymphomas tends not to be generalized and the individual nodes usually vary considerably in size. Generalized lymphadenopathy in which the nodes are uniformly enlarged is often seen in chronic lymphocytic leukemia and acute leukemia of childhood, as well as in certain reactive disorders such as sarcoidosis and systemic lupus erythematosus. It is uncommon in this setting for the lymph nodes to exceed 2 cm in diameter. This is a useful clinical point. The patient presented today exhibited symmetrical and generalized lymph node enlargement. However, some of his lymph nodes, especially those in the cervical region, exceeded 3 cm in diameter. Thus the characteristics of the lymphadenopathy in this patient had features suggestive of both a lymphoma and a reactive disorder.

Spread in Hodgkin's disease is fairly predictable; in perhaps 70-90 per cent[6-7] of cases, contiguous lymph node areas are sequentially involved. As will be discussed, this predictable spread is of considerable importance in the planning of radiotherapy for patients with localized Hodgkin's disease. In lymphosarcoma and reticulum cell sarcoma, non-contiguous spread within the lymphocytic system appears to be the rule rather than the exception. The presence or absence of systemic symptoms is also of therapeutic and prognostic importance in Hodgkin's disease. The systemic symptoms of specific importance are fever, sweats and/or itching. Whether these symptoms are of similar importance in lymphosarcoma and reticulum cell sarcoma is uncertain.

The laboratory may contribute important information in patients with lymphoma. Anemia is usually slight or absent in the individual with localized disease, but becomes more prominent as the disease disseminates. When present, it is most frequently the result of marrow infiltration by lymphomatous tissue and/or therapy with drugs or radiation. Autoimmune hemolytic anemias are occasionally seen in patients with lymphosarcoma and Hodgkin's disease. Host defenses are frequently compromised and are associated with infectious complications. These defense alterations include reduction of one or more of the classes of immunoglobulins and/or alteration in cell-mediated (delayed hypersensitivity) host defense. Such alterations are common in Hodgkin's disease and lymphosarcoma, but not in reticulum cell sarcoma. In Hodgkin's disease anergy is often present in individuals with generalized disease. Alteration in cellular immunity is probably related to the frequency with which these patients may develop disseminated vaccinia or herpes zoster. Neutropenia and thrombocytopenia are most often the result of therapy.

Proper management of patients with lymphoma requires precise definition of the extent of the disease. This is referred to as clinical staging. The stages of the disease are defined in Chart I. Although this staging classification was specifically developed for Hodgkin's disease, it is equally applicable to lymphosarcoma and reticulum cell sarcoma.

CHART I. CLINICAL STAGES OF HODGKIN'S DISEASE[8]

STAGE I.	DISEASE LIMITED TO 1 ANATOMIC LYMPH NODE REGION OR TO 2 CONTIGUOUS ANATOMIC REGIONS OF THE SAME SIDE OF THE DIAPHRAGM.
STAGE II.	DISEASE IN MORE THAN 2 ANATOMIC REGIONS OR IN 2 NON-CONTIGUOUS REGIONS ON THE SAME SIDE OF THE DIAPHRAGM.
STAGE III.	DISEASE ON BOTH SIDES OF THE DIAPHRAGM, BUT NOT EXTENDING BEYOND THE INVOLVEMENT OF LYMPH NODES, SPLEEN, AND/OR WALDEYER'S RING.
STAGE IV.	INVOLVEMENT OF THE BONE MARROW, LUNG PARENCHYMA, PLEURA, LIVER, BONE, SKIN, KIDNEYS, GASTROINTESTINAL TRACT, OR ANY TISSUE OR ORGAN IN ADDITION TO LYMPH NODES, SPLEEN, WALDEYER'S RING.
	SUBCLASS A. ABSENCE OF SIGNIFICANT FEVER, NIGHT SWEATS, AND ITCHING.
	SUBCLASS B. PRESENCE OF OTHERWISE UNEXPLAINED FEVER, NIGHT SWEATS, AND/OR ITCHING.

Under this classification, those with Stage I or Stage II are considered to have localized involvement while those with Stage III or IV have generalized involvement. The importance of accurate clinical staging relates to management of these patients. With currently available radiotherapeutic technics, patients with localized disease, and perhaps some patients with Stage III involvement, are potentially curable. For those individuals with Stage IV involvement, intensive radiotherapy with intent to cure is not justified and is potentially harmful.

On the basis of the information given by Mr. Wilson, our patient today would be put in Stage III or IV, Subclass B. Stage III because he had lymph node involvement on both sides of the diaphragm. On the basis of hepatomegaly and abnormal liver function tests, one would suspect extranodal involvement of that organ, but histologic confirmation was not obtained. It also seems appropriate to attribute his fever to Hodgkin's disease because this symptom persisted after treatment of those diseases (streptococcal pharyngitis and shigellosis) which might have explained it.

In order to accurately stage the individual with lymphoma, one must have knowledge of the anatomic sites of lymphoreticular tissue in the body, the methods available to determine involvement in each of these particular sites, the extra-lymphatic organs which may be involved, and the means whereby involvement of these organs may be established or excluded. The cervical, occipital, supra-clavicular, infraclavicular, axillary, pectoral, inguinal, femoral and popliteal lymph node areas are evaluated by inspection and palpation. Waldeyer's ring also requires palpation plus direct and indirect inspection. The mediastinal and hilar lymph node areas are screened by standard chest films and, if these are suspicious, by tomograms. In the absence of palpable enlargement of intra-abdominal lymph nodes, assessment of lymphoreticular tissue between the diaphragm and pelvic floor requires several radiologic technics. These include an intravenous urogram, an inferior venacavagram, and/or a bilateral lower extremity lymphangiogram. The first two technics give indirect evidence of involvement, that is, lymphadenopathy is indirectly identified by deformation of the urinary collecting system or inferior vena cava. The lymphangiogram gives direct evidence of involvement in that the radio-opaque dye actually fills the lymph node. These three technics permit evaluation of iliac and para-aortic nodes. The lymphangiogram is more sensitive to intra-abdominal involvement than the other two procedures. It should be remembered that lymphangiography is not indicated in those with evidence of Stage IV disease, and is contraindicated in those with palpable intra-abdominal lymphadenopathy or with intrinsic pulmonary disease because of the hazard of oil emboli from the dye. Recent studies,[9,10] in which laparotomy has been performed for staging indicate that both false-positive and false-negative results are not uncommon utilizing these three x-ray procedures. Finally, splenic involvement can be assessed by palpation of an enlarged organ or by demonstration of splenomegaly by isotope scanning. Inasmuch as the lymphomas often show focal rather than diffuse involvement, a splenic scan may also permit detection of space-occupying lesions within that organ.

As noted earlier, it is critical to identify those individuals with extra-nodal involvement so that they are not subjected to unnecessary, expensive, and potentially dangerous radiotherapy. The following studies are appropriate in this regard. Bone marrow involvement is sought in all patients with

lymphoma. In Hodgkin's disease, it is generally believed that a biopsy, either by needle or open surgical technic, is necessary since the diagnosis is based on histologic and not cytologic changes. Bone marrow biopsy is not necessary, and a standard marrow aspiration will suffice, in lymphosarcoma and reticulum cell sarcoma since cytologic changes are sufficient for diagnosis. Bromsulfalein retention and serum alkaline phosphatase are fairly sensitive indices for space-occupying lesions of the liver. Many authorities recommend that a liver scan (I^{131} Rose Bengal) be done in all patients. If any of these tests are abnormal, a liver biopsy should be performed. Renal involvement is sought for a urinalysis, a creatinine clearance, and an intravenous urogram. Involvement of the skeletal system is best detected by radioscope scanning; standard radiographic survey is less sensitive.

The value of laparotomy as a staging procedure has not been fully established.[9-10] However, laparotomy has provided valuable insight concerning the accuracy and sensitivity of currently employed staging procedures. For example, lymphangiography is associated with a significant number (perhaps as high as 20 per cent) of both false-positive and false-negative results. Splenic involvement, as determined by palpation and isotopic scanning, is also subject to false-positive and negative results. In addition, although laparotomy appears to be a more sensitive and accurate indicator of intra-abdominal involvement, even exploration apparently does not detect the full extent of the disease.

The presence of unexplained fever, sweating, or itching, is usually associated with generalized (III or IV) disease. These symptoms may occur, although uncommonly, in patients with documented Stage I or II. Their presence does not exclude the possibility of cure. Other systemic symptoms such as weight loss, fatigue, anemia, leukocytosis or leukopenia, cutaneous anergy, or alcohol-induced pain are important to document, but do not relegate a patient to Subgroup B. Of interest in the patient presented was the prompt lysis of fever with indomethacin. This response, while not specific for Hodgkin's disease, is often useful for relief of this distressing symptom.

In summary, both the histology and clinical extent of disease provide valuable information concerning prognosis, and both are interrelated. In Hodgkin's disease, the lymphocyte predominant form is usually associated with Stage I or II, whereas most with lymphocyte depletion will have Stage III or IV involvement. Systemic symptoms are rarely found in association with lymphocyte predominance, but are common with lymphocyte depletion. In the mixed-cellular forms the relationship with the clinical stage is less striking. Systemic symptoms may or may not be present, and when present, appear to correlate best with infradiaphragmatic involvement. The pattern of nodular sclerosis is usually associated with localized disease above the diaphragm (mediastinal and/or lower cervical.) Systemic symptoms are uncommon. Other features associated with a favorable prognosis in Hodgkin's disease include a long history of slowly enlarging nodes, occurrence in individuals less than 40 years of age, and occurrence in the female. In lymphosarcoma, the prognosis for survival is relatively good in the lymphocytic type, and less favorable in the lymphoblastic variety. Reticulum cell sarcoma is also associated with a poor prognosis. It should be stressed, however, that lymphosarcoma and reticulum cell sarcoma of a localized type (Stage I or II) or with involvement of such extranodal sites as the scalp, gastrointestinal tract, or bone is potentially curable and should be treated with that intent.

In respect to management, several concepts deserve emphasis. The first is that all cases of lymphoma, if untreated or inadequately treated, are uniformly fatal. However, there exists among patients with lymphoma a population with localized disease which can be cured with currently available radiotherapeutic technics. This statement often leads to skepticism aroused by use of the word "cure." I believe that the definition of "cure" offered by Easson and Russell[11] is both practical and realistic: "We can speak of cure when in time—probably a decade or so after treatment—there remains a group of disease-free survivors whose progressive death rate from all causes is similar to that of a normal population of the

same sex and age constitution." By this definition lymphoma patients with a post-treatment disease-free survival of 10 years can be considered cured. Kaplan[12] has noted that in Hodgkin's disease over 95 per cent of post-treatment disease-free survivors who are destined to relapse will do so within five years. He concludes that the individual who shows no evidence of disease for five years following therapy is probably cured. The question then arises "What proportion of patients present with localized disease and are thus candidates for curative therapy?". Only limited information is available to answer this question. In one series,[12] over half of the cases of Hodgkin's disease, and approximately 25 per cent of those with lymphosarcoma and reticulum cell sarcoma, presented with Stage I or II involvement.

A second concept which has bearing on the philosophy of management relates to the way in which these disorders originate and spread. While the debate concerning unicentric vs. multicentric origin cannot be resolved at this point, it is clear that a significant proportion of patients have disease confined to a single lymph node area when first seen. In such cases the subsequent spread of the disease is predictable to some extent. Kaplan and Rosenberg[13] and Johnson[7] cite data which indicates that in 70-90 per cent of patients with Hodgkin's disease, spread occurs via lymphatic channels to contiguous lymph node areas. The frequency of contiguous spread in lymphosarcoma and reticulum cell sarcoma is certainly less, perhaps about 30 per cent. Recognition of this aspect of the biologic behavior of these diseases allows one to understand the intent of and approach to radiation treatment in localized lymphoma.

Finally, a critical cornerstone upon which treatment with curative intent is based relates to the effect of radiation on lymphomatous tissue. In Hodgkin's disease Kaplan[14] has shown that the frequency of local recurrence following radiation is inversely related to the dose, and that the local recurrence rate approaches zero at a dose of approximately 4,000 rads delivered at a rate of about 1,000 rads per week. The dose for lymphosarcoma appears to be about the same, but reticulum cell sarcoma requires between 4,500 and 5,000 rads for an equal degree of tumor control. From a practical point of view, dosage of this magnitude cannot be given with conventional orthovoltage equipment; megavoltage energy beams (for example, linear accelerator, betatron, telecobalt therapy apparatus) are required.

It is upon these considerations that the current management of lymphoma is based. Such management may be summarized as follows: for those patients with Stage I or II disease, radiation therapy with intent to cure is indicated. These individuals should receive radiation to all involved lymphoid tissue. The question as to whether all uninvolved but contiguous lymph node areas should also be treated is still unsettled. The basis of treatment of contiguous areas is that it is these areas that are most apt to be involved but clinically undetectable disease at the time of staging. There is some evidence[7,12] that treatment of contiguous nodes offers no survival advantage to Stage I and II cases without systemic symptoms, but that significant improvement in survival is seen in these same stages in individuals with fever, sweats or itching.

The proper approach to management of patients with Stage III involvement is less clearly defined. It would appear that some of these patients, particularly those without systemic symptoms, may be cured with appropriate radiotherapy. In some centers this approach is being evaluated. Pending results of these studies, patients with Stage IV disease can be treated with either curative or palliative intent. In Stage IV disease, there is at present general consensus that the therapeutic approach should be palliative. The primary goal here is prolongation of a qualitatively useful life. Although radiation and/or surgery may be useful for problems such as spinal cord compression, vena cava obstruction, and hypersplenism, chemotherapy is the mainstay of management of these patients. The value, if any, of combined x-ray and chemotherapy has not been identified in patients with either localized or generalized lymphoma. As in acute leukemia, recent studies[15,16] in generalized lymphoma have shown that the frequency of remission induction and the duration of remission is greater when a combination of drugs is employed rather than with a single agent. Also,

as was observed in acute leukemia, the duration of the remission will be significantly prolonged if chemotherapy is maintained during the remission. While the details of these therapeutic programs are beyond the scope of this presentation, it was these observations that led to the use of the drug combination which was given to the patient presented today. In his case, the approach was successful and he remains in remission to this date.

QUESTIONS

Is there any evidence to suggest that the lymphomas may be infectious in nature?

Dr. Hardy: The evidence that human lymphomatous disease may be infectious is circumstantial. For instance, MacMahon[17] has cited epidemiologic observations that Hodgkin's disease in youg adults may be infectious in nature (for example, the recording of three husband-wife occurrences is interpreted on statistical grounds to be unlikely the result of chance alone). Another observation which may relate to the possibility of an infectious etiology is the great increase in activated lymphocytes observed in the patient today as well as reported by others. This feature so common in certain viral diseases (hepatitis, mononucleosis) was not something I had associated with Hodgkin's disease at the time this man was first seen. Since then others have noted an increase in the number of activated lymphocytes in the blood of patients with this disorder. Thus the known association of lymphocytic changes of this type with viral diseases raises the possibility that Hodgkin's disease may have an infectious etiology.

How often does the histologic picture change during the course of Hodgkin's disease?

Dr. Hardy: Transition from one histologic type to another appears to be unusual, as is the finding of a different histologic type from another site in the same patient.

What has happened to the disorder referred to as giant follicular lymphoma?

Dr. Hardy: This condition was considered to be a form in which there was striking accentuation of the follicular pattern seen in normal nodes. Many pathologists now believe that giant follicular lymphoma is simply an exuberant nodular form of lymphosarcoma, Hodgkin's disease, or reticulum cell sarcoma. There is a trend to place cases with this particular pattern into Hodgkin's, lymphosarcoma, or reticulum cell sarcoma category, dependent upon the histocytologic pattern. •

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Hematologic and oncologic disorders in urologic disease*

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The purpose of this paper is to present a classification of the hematologic and oncologic disorders in renal and urologic disease and to emphasize a few points of great practical importance.

THE CLASSIFICATION OF THE disorders to be discussed is shown in Table 1 and includes the anemias of renal disease, the renal manifestations of hematologic malignancies, solid tumors of the genitourinary tract, and bleeding problems associated with prostatic surgery.

1. Anemia

A. **RENAL FAILURE:** The important characteristics of renal failure are summarized in Table 2, and are as follows:[1,2]

(1) The anemia is usually normochromic, normocytic and occasionally may be hypochromic, especially if the patient is bleeding.

(2) The serum iron level and total iron binding capacity are usually decreased, although bone marrow aspiration reveals increased iron stores. These abnormalities reflect the failure of iron reutilization resulting in iron desposition in the reticulo-endothelial system; therefore, the iron is not utilized effectively for red cell production.

(3) The reticulocyte count is usually depressed. Occasionally, reticulocytosis is present and examination of the peripheral smear may reveal polychromatophilia and nucleated red blood cells. Severe anemia is associated with an increased plasma iron transport, decreased red cell utilization of iron and normal or slightly decreased red cell survival. There is only transient improvement of the ferrokinetics with hemodialysis.

(4) When marked renal insufficiency is present, bone marrow examination may reveal erythroid hypoplasia.

TABLE 1
Hematologic and Oncologic Disorders in Urologic Disease

1. Anemia.
   - A. Renal failure—acute and chronic
   - B. Red cell fragmentation — hemolytic uremic syndrome, TTP, etc.
2. Hematologic Malignancies.
   - A. Paraproteinemias.
     1. Multiple myeloma
     2. Macroglobulinemia
   - B. Leukemia and Lymphomas
   - C. Polycythemia
     1. Primary—renal vein thrombosis
     2. Secondary—hypernephromas, cystic disease, hydronephrosis, post-transplant, etc.
3. Solid Tumors
   - A. Hypernephroma
   - B. Prostatic carcinoma
   - C. Testicular carcinoma
4. Bleeding associated with Prostatic Surgery
   - A. Procedure selection
   - B. Post TUR bleeding—intravascular coagulation versus fibrinolysis.

TABLE 2
Anemia of Renal Failure

1. Normochromic normocytic; occasionally hypochromic. ↓ Fe, ↓ TIBC (variable). ↑ Fe in the marrow.
2. ↓ Reticulocytes (variable); occasionally polychromatophilia and nucleated RBC's present.
3. Marrow—erythroid hypoplasia (late stage).
4. Etiology—primarily due to ↓ production; blood loss
5. Anemia present with a GFR of 25 or less (variable). and hemolysis may contribute.
6. If Hg.↓ $\geq$1 gm/week search for additional component besides ↓ production; i.e., blood loss or hemolysis.
7. Platelets usually functionally abnormal.
8. Tranfuse with blood $\leq$ 1 week old.

*Presented at The Denver Clinical Experiences Day, December 6, 1969. The author is in the Department of Hematology and Oncology, The Denver Clinic and Clinical Instructor in Medicine, Denver General Hospital, Denver.

(5) The anemia of renal failure is primarily due to decreased red cell production, which is related to reduced erythropoietin levels. Blood loss and hemolysis may also contribute. Erythropoietin levels remain unchanged following dialysis, but they are reduced even further after bilateral nephrectomy.

(6) Patients with renal insufficiency usually develop anemia when the glomerular filtration rate is 25 or less. However, anemia may be present with lesser degrees of renal insufficiency. For a given glomerular filtration rate, the anemia is usually of greater severity in chronic than in acute renal failure. The anemia of acute renal failure may persist for months, or for even a year or longer after the acute episode.

(7) If the hemoglobin reduction is greater than a gram per week, an additional component besides decreased red cell production is present. Therefore, a search for blood loss and hemolysis is indicated. If a patient has a normal hemoglobin of 15 grams and if his red cell production ceased, it would take 120 days for the hemoglobin to go from 15 to 0, assuming that the life span of the red cell is normally 120 days. Therefore, if complete marrow shutdown was present, it would take eight days (120/15) for the hemoglobin to decrease one gram. More rapid reduction suggests hemolysis or blood loss as noted above.

(8) Smear examination reveals that the platelets are occasionally reduced in number, but more often numerically normal. However, they are frequently functionally abnormal and may not produce effective hemostasis. A reduction in platelet factor 3 is often present.

(9) The patient should be transfused with blood less than a week old and as fresh as possible, especially if hyperkalemia is present. The potassium content increases with the age of the blood, and fresh blood will survive longer in a recipient than older blood. After patients undergo bilateral nephrectomy, transfusion requirements and complications increase. This is presumably due to reduced erythropoietin production. This risk should be weighed carefully before performing the procedure.

B. RED CELL FRAGMENTATION:

The characteristics of the anemia associated with red cell fragmentation are as follows: smear examination reveals distortion and contraction of the red cells.[3] Burr cells, helmet cells and schistocytes may be present. In cases of renal failure it is of considerable importance to look at all smears to detect red cell fragmentation. If fragmentation is present, one should be aware that there are a number of diseases that can produce these changes in the red cells (see Table 3).

TABLE 3

Disorders Associated with Red Cell Fragmentation

1. Microangiopathic Hemolytic Anemia
   - Thrombotic thrombocytopenic purpura
   - Hemolytic uremic syndrome
   - Renal cortical necrosis
   - Systemic lupus erythematosus
   - Polyarteritis nodosa
   - Purpura fulminans
   - Generalized Schwartzman reaction
   - Hemangiomas
   - Malignant hypertension
   - Eclampsia
   - Acute glomerulonephritis
   - Sickle cell anemia with pulmonary emboli
   - Disseminated carcinoma
2. Cardiac Diseases and Cardiovascular Prostheses

Two of these diseases, thrombotic thrombocytopenic purpura[4,5] and the hemolytic uremic syndrome,[6] will be discussed in more detail. The similarities and differences regarding these syndromes are presented in Table 4.

The hemolytic-uremic syndrome occurs in children, most often infants. The pathologic changes are predominantly renal. Thrombotic thrombocytopenic purpura occurs in young adults, most often in the third decade of life. In this disease the pathologic changes involve not only the kidney, but also several other organs, including the brain.

Similar symptoms and physical findings are present in these diseases. The laboratory abnormalities include red blood cell fragmentation, intravascular hemolysis, and thrombocytopenia. Intravascular hemolysis

TABLE 4

Hemocytic Uremic Syndrome vs. TTP

Differences		Similarities
HUS (a) Age of onset Infancy—15 yrs.	Pathology Involves kidneys primarily	1. Symptoms: abdominal pain, vomiting, fever oliguria; CNS—general or focal 2. Physical finding: pallor, jaundice, ↑ BP and occasionally hepatosplenomegaly 3. Lab: RBC fragmentation Intravascular hemolysis Thrombocytopenia Erythroid hyperplasia Proteinuria, hematuria, pyuria, casts, azotemia 4. Treatment: Supportive — dialysis, transfusions (exchange) and anti-hypertensives Steroids Heparin Splenectomy
TTP 10-39 years (most)	Involves kidneys and many other organs	

is manifested by an increased indirect bilirubin, retriculocyte count, and LDH; hemoglobinemia, hemoglobinuria, hemosiderinuria, and reduction of serum haptoglobin. Bone marrow aspiration reveals erythroid hyperplasia. The renal manifestations include proteinuria, hematuria, pyuria, urinary casts and azotemia.

The treatment for the hemolytic-uremic syndrome consists of supportive care, which includes dialysis, antihypertensives, transfusions, and on occasion, exchange transfusion. Although the efficacy of steroids and heparin has not been proven, they are used almost routinely. Heparin, steroids and splenectomy have been used for thrombotic thrombocytopenic purpura. In a few patients the combination of steroids and splenectomy has resulted in prolonged survival.

2. *Hematologic Malignancies.*

A. Paraproteinemias.

(1) Multiple Myeloma. In multiple myeloma there are two points of great significance. First, before performing an IVP, especially if proteinuria is present, one should always consider the diagnosis of multiple myeloma. The routine dehydration procedure, done prior to an IVP, has resulted in precipitation of acute renal failure in patients with this disease.[7] This complication can be avoided by pre-IVP hydration. Second, for patients with multiple myeloma and significant renal insufficiency, the drug of choice is Cytoxan. This drug is activated in the liver and only a small per cent is excreted unchanged via the kidney. Cytoxan can be given in almost full doses at very low levels of renal function. Alkeran, an otherwise equally effective drug, is excreted primarily by the kidneys, and requires dosage reduction when renal insufficiency is present.

(2) Macroglobulinemia. Plasmaphoresis is an effective mode of therapy for patients who develop renal failure secondary to macroglobulinemia.[8] Plasmaphoresis is effective because (1) macroglobulins are primarily intravascular and their removal causes considerable reduction in serum viscosity, and (2) their removal doesn't stimulate increased production. It is ineffective in multiple myeloma because: (1) myeloma proteins are more evenly distributed between the intravascular and extravascular spaces. Their removal from the vascular space results in leakage from the extravascular to the vascular space as osmotic equilibrium is reestablished and (2) their removal stimulates increased production.

B. Lymphomas and Leukemias.

Lymphomas and leukemias rarely cause significant renal impairment due to infiltration.[9] The most difficult problem is managing the hyperuricemia due to tumor, or treatment or both. When treating patients with very chemosenitive tumors, such as small cell lymphosarcoma, or when using potent chemotherapeutic agents, such as nitrogen mustard, one must be especially cautious. In these situations Allopurinol is very effective. Another important problem associated with lymphomas and leukemia is the hazard of

developing radiation nephritis during a course of abdominal x-ray therapy. Therefore, proper shielding is important, because the maximum tolerable renal dose is approximately 2,500 roentgens.

C. Polycythemia.

(1) Primary Polycythemia. Primary polycythemia is not usually associated with renal disease, although renal vein thrombosis has been reported. Polycythemia, secondary to renal disease, is not uncommon.

(2) Secondary Polycythemia. Hypernephromas,[10] adenomas, cystic disease,[11] hydronephrosis, and transplantation[12] have all been implicated. It is of great importance in patients with polycythemia that: (1) the abdomen should be carefully palpated, not only for hepatosplenomegaly, but also for renal masses and (2) an IVP should be performed as part of the workup for secondary polycythemia, and, if abnormal, then further studies such as arteriography, nephrotomography, etc. are indicated. In cases of secondary polycythemia, erythropoietin levels are frequently elevated, not only in the serum, but also in tumors and cysts. These levels can be used to monitor response to therapy and tumor recurrence.

3. Solid Tumors.

Significant advances have been made in solid tumor chemotherapy in the last ten years. Because effective therapy is available for most of these tumors, it is important not to turn away patients with disseminated carcinoma.

A. Hypernephroma. Large doses of progestational agents are the treatment of choice for hypernephroma.[13] Initially, Provera is given in doses of 800 mg. I.M. per week, and subsequently in doses of 400 mg. I.M. per week. Androgens and focal x-ray therapy are also useful but, unfortunately, cytotoxic therapy has been relatively ineffective.

B. Prostatic Carcinoma. At the present time, the treatment of prostatic carcinoma is changing. In 1967, a cooperative study from the Veterans Administration, revealed that estrogens, in doses of 5 mg. daily, cause an increased incidence of cardiovascular deaths.[14] At present, it appears that either orchiectomy or perhaps 1 mg. daily of stilbesterol might be the most effective treatment. This therapy is indicated only if the patient requires symptomatic relief. Combining the two modes of therapy doesn't enhance the therapeutic effect. Experimental programs in progress include the use of a drug called cyproterone acetate, which is a progesterone-like substance.[15] Radiotherapy in doses up to 8,000 roentgens to the central prostatic area is presently being evaluated.[16]

C. Testicular Carcinoma. Therapy of disseminated testicular carcinoma is often mismanaged.[17] If the patient has a pure seminoma, radiation therapy is very effective. If the tumor doesn't respond to x-ray, the biopsy should be carefully reviewed. Elements of embryonal cell carcinoma, malignant teratoma, and choriocarcinoma may be present, and if found, triple therapy is indicated. This consists of the combined use of Methotrexate, chlorambucil and Actinomycin D. Oncologic referral and good bone marrow function are two prerequisites for this type of therapy.

4. Bleeding Associated with Prostatic Surgery.

A. Procedure Selection. For patients with bleeding tendencies, a transurethral resection is favored over a suprapubic prostatectomy if possible, because it is easier to observe and control postoperative bleeding. Cryosurgery is ideal because of the minimal postoperative blood loss.[18] Complications such as ureteral freezing, tissue necrosis, and prolonged catheterization preclude its routine use.

B. Post-TUR Bleeding. The management of bleeding after transurethral resection is of great importance. In the past, urologists have used epsilon amino caproic acid indiscriminately, assuming that fibrinolysis was always the etiology. However, intravascular coagulation may also cause post-transurethral resection bleeding,[19] and it is most important to distinguish between the two. The differences

TABLE 5

Test	Intravascular Coagulation	Primary Fibrinolysis
1. Ethanol gelatin	+	—
2. Clot retraction	Poor clot retraction	good clot retraction and premature lysis
3. Platelets	↓	N (usually)
4. PT, PTT, Factors 5 7 8	↓↓	↓
5. Euglobulin lysis time	Normal or slightly↓	↓
6. Rx	Heparin	EACA

are enumerated in Table 5.[20] The ethanol gelation test is most useful in separating the two syndromes.[21] During intravascular coagulation there is an increase of a fibrin monomer, which is an intermediate in the coagulation chain. This monomer will jell a 50 per cent solution of ethanol and form a precipitate. This is a simple, rapid, accurate test and is negative in primary fibrinolysis. In separating these two entities, clot observation, platelet counts, and euglobulin lysis are also quite helpful, whereas the prothrombin time and partial thromboplastin time are somewhat less helpful. The treatment of choice for intravascular coagulation is heparin, and for fibrinolysis is epsilon amino caproic acid. •

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A survey of head and neck cancer in Utah*

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In few areas of the body does regular surveillance and continued medical care play such an important role in patient survival as it does in cancer of the head and neck. This area of the body is readily accessible for examination and has a rich network of lymphatics draining into easily detected cervical lymph nodes. The major histologic type (excluding the thyroid and salivary glands and the lymphomas) is squamous cell carcinoma which seldom spreads by way of the blood stream, but frequently metastasizes to regional lymph nodes. Death from these diseases is most often from local or regional recurrence rather than from distant spread, and, therefore, is theoretically more curable by radical resection or radiation therapy than some carcinomas, i.e. bronchogenic carcinoma, where distant spread is more the rule. Where radiation has been the first modality in therapy, the patient may later develop cervial lymph node metastases, which can still possibly be cured by a radical neck dissection. Close follow-up examination becomes obligatory for maximum patient survival.

One of the shortcomings of many reports dealing with the end results of cancer therapy is that they frequently deal with carefully selected cases, resulting in overoptimistic survival rates, and they may not reflect the actual experience one could expect with a uniform sample. At times an automatic selection occurs because of an institutions' clientele, facilities or specialized physicians, and even though that hospital's tumor registry records all of the cases, one may still not be able to get a clear view of the expected survival in a given malignancy.

The present study represents the merged experience from all of the hospitals of Utah, unselected as to age, sex, race, or socioeconomic status, but realizing that the Morman religion's taboo on tobacco has resulted in the consumption of about one-half the expected amount of cigarettes per capita in this state as compared with the rest of the United States.[1] This latter factor might be expected to affect the incidence of squamous cell car-

**A computerized registry system, a confederacy of Colorado, Idaho, Montana, Wyoming and Utah state tumor registries.

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cinoma in this area, but should not affect survival rates of those diagnosed.

These data were obtained from the Utah Tumor Registry, which is a part of the six state Rocky Mountain States Cooperative Tumor Registry. The head and neck cancers were recorded in a few hospitals since 1957, and in all hospitals since 1966. The data have been gathered from hospital charts by tumor registry secretaries and tumor registry representatives. The data have been updated through computer-written letters to physicians, re-admission hospital records, death certificated and public health nurse reports. The accuracy of the data depends upon the accuracy of the initial hospital chart, the knowledge and experience of the tumor registry secretary and upon the diligence of the physician in filling out his follow-up letters as regards subsequent treatment and dates of last examination.

The following graphs demonstrate the six most common sites for malignant disease of the head and neck exclusive of thyroid cancer.

Cancer of the Head and Neck in Utah**

	Lip	Tongue	Floor of Mouth	Sinuses	Larynx	Salivary Gland
# Cases	288	103	67	63	244	93
Ave. #/Yr.	39	13	8	7	27	9
% Hist. Confir.	97	100	100	98	99	100
# Males	256	71	54	38	217	54
# Females	30	32	13	25	27	39
Ave. Age.	58	60	62	61	63	60
# with Multiple Primary Malignancies	3	13	9	6	25	9
DELAYS						
Patient						
Under 1 Mo.	50%	47%	62%	68%	44%	50%
1-3 Mo.	18%	35%	24%	8%	35%	33%
Over 3 Mo.	32%	18%	14%	25%	21%	16%
Physician						
Under 1 Mo.	95%	91%	88%	85%	80%	94%
Treatment						
Under 1 Mo.	98%	91%	91%	92%	97%	99%
Stage at DX						
Localized	92%	40%	48%	63%	57%	60%
Regional	6%	50%	45%	25%	29%	27%
Distant	1%	7%	6%	6%	6%	12%
Unknown	1%	—	1%	3%	4%	1%
Primary Rx						
Surgery	261	44	28	39	87	76
Radiation	18	35	21	10	88	4
Surg.-Rad.	3	19	10	8	40	8
Chemo. or Oth.	—	2	3	5	2	4
Subsequent Rx						
Surgery	51	22	8	8	21	29
Radiation	8	8	4	7	38	7
Surg.-Rad.	9	10	6	7	11	6
Chemo. or Oth.	1	9	2	6	9	4
Status						
Alive W/O	183	30	26	21	81	34
Alive WITH	14	10	6	8	35	11
Dead W/O	16	3	2	1	8	5
Dead WITH	24	52	30	25	82	29
Lost	35	3	2	2	24	6
5 year survival rate	60%	24%	39%	34%	42%	50%

**The totals in some of the above catagories do not add up to the total in the series due to the fact that some patients have not had any follow-up after initial diagnosis and treatment, and in others because it was not applicable.

The 858 cases included in this study make up 3-4 per cent of all malignancies in the Utah Registry. These sites constitute about 103 malignancies per year and the most frequent sites are lip, larynx, tongue, salivary gland, floor of mouth and sinuses, in order of decreasing frequency. There was a significant predominance of males over females in all sites. The average age is about 60 years. Eight per cent of the cases had other associated malignancies. Patients had symptoms for more than one month in 56 per cent of cancer of the tongue, 50 per cent of cancer of the salivary glands, 50 per cent of cancer of the lip, 38 per cent of cancer of the floor of the mouth, 32 per cent of cancer of the sinuses. Physicians diagnosed the problem promptly in 90 per cent of the cases, with the exception of cancer of the larynx and sinuses. Once diagnosed nearly all were treated promptly.

With the exception of cancer of the lip, the rest of the malignancies had a high percentage of regional involvement at the time of initial diagnosis: tongue 50 per cent, floor of the mouth 45 per cent, larynx 29 per cent, salivary 27 per cent, and sinuses 25 per cent; and 7 per cent had distant involvement at the time of diagnosis. Surgery was the leading modality of treatment in all lesions except cancer of the larynx, where radiation was used slightly more as initial therapy. Chemotherapy was little used as either a primary or subsequent treatment. The absolute five year survival rate was 60 per cent in the lip, 50 per cent in the salivary glands, 42 per cent in the larynx, 39 per cent in the floor of the mouth, 34 per cent in the sinuses and 24 per cent in the tongue.

Discussion

Because malignancies of the head and neck, with the possible exception of larynx and sinuses, should be easily detected by almost any physician, it is surprising that these malignancies frequently are not detected at a very early stage and treated adequately with a greater cure rate. Comparison with the results published in Cancer Statistics by the American Cancer Society is not possible since they are utilizing the relative survival rates which have been adjusted for normal life expectancy, comparison is possible with other groups utilizing the absolute survival rates—see following graph.

In attempting to compare results of cancer therapy it is important to have the groups as similar as possible, in cancer registries this is done by comparing similar stages of disease. The following graph shows the percentage of localized disease for each of the above sites:

It is interesting to note the more advanced stage of disease which was seen at the University of Kansas Medical Center as compared to the general coverage seen in the state registries of Iowa and Utah. While Utah does not compare unfavorably with these other groups we feel that much improvement can occur through the cooperative effort of the general practitioner, surgeon, dentist, radiation therapist, and speech therapist in the optimal treatment of these patients. The high

PERCENTAGE FIVE YEAR SURVIVAL RESULTS

	Lip	Tongue	Floor of Mouth	Sinuses	Larynx	Salivary Gland
**American Ca.	88%	28%	51%	—	57%	—
*Iowa State	65%	31%	36%	—	48%	—
			36%	23%	41%	79%
*Kansas U.	67%	27%				(benign incl.)
*Utah State	60%	24%	39%	34%	42%	50%

PERCENTAGE OF LOCALIZED STAGE OF DISEASE

American Ca.	89%	41%	44%	37%	58%	76%
Iowa	90%	37%	56%	43%	60%	70%
Kansas U.	67%	35%	30%	8%	20%	70%
Utah	92%	40%	48%	63%	57%	60%

**The American Cancer Society results have been adjusted—*relative* survival.[4]

*Iowa, Kansas and Utah are utilizing the *absolute* life survival method.[2-3]

number of patients lost to follow-up with cancer of the lip and larynx points out the need for closer attention in the re-examination of this group in doctors' offices if we are to improve their survival. Further indepth studies will be reported on each of these sites in the future.

Summary

The six major sites of malignancies of the head and neck in Utah, exclusive of thyroid cancer, are discussed as regards stage of disease at diagnosis, treatment, five year survival and follow-up. Eight hundred fifty eight cases were recorded from these sites. •

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Hepatic resection in neoplastic obstructive jaundice

A case report

David E. Hutchison, MD, Denver
Ronald Zeegen, MD, MRCP, and Alan H. Hunt, F.R.C.S., London, England*

Resection of carcinoma of the liver is presented to demonstrate that obstructive jaundice is not necessarily a contraindication for surgery and that thorough radiologic workup is helpful in assessing the candidacy of patients for such surgery.

LOCAL RESECTIONS OF tumor in the liver have been recorded as early as 1899 by Keen.[9] Hepatic resections were introduced by Pattinari[20] and Lortat-Jacob and Robert[10] who ligated the major branches of the vessels in the hilum before resecting cancers of the liver. Quattlebaum[21,22] and Pack[16] improved the technic of controlled hepatic lobectomy. Guynn perfected this by showing that the division of the lobes should be carried out in the interlobar fissures.[7] In addition, he stressed the need for adequate drainage of the liver bed as well as intravenous replacement of the protein, dextrose and electrolytes loss following resection, as described by McDermott[1] and Pack and Molander.[19] Finally McDermott[11,12] has suggested the importance of radiologic studies, such as cholangiography and coeliac angiography, as tools for precise anatomic definition of intrahepatic lesions being considered for resection. To illustrate the application of these principles a case is presented of a boy who was known to have obstructive jaundice due to carcinoma of the liver for over a year, who underwent removal of neoplastic blockage of the common bile duct along with massive left hepatic resection, and who has been followed for 14 months.

*From St. Bartholomew's Hospital, London, England.

CASE HISTORY

A 20-year-old electrician apprentice, otherwise healthy, developed pale, loose stools in May, 1967. He then became weak and unwell. He was noticed to have jaundice during his second bout of diarrhea which was coupled with dark urine. By June, the patient had lost five pounds and was examined in the hospital. There was no history of exposure to hepatotoxic drugs or to infectious liver disease. The findings at that time were cervical and axillary lymph nodes, jaundice, non tender hepatomegaly and questionable splenomegaly.

Because the patient's jaundice did not improve with bed rest, he was hospitalized on June 29, 1967. He had scratch marks, hepatomegaly 3-4 centimeters below right costal margin and deepening jaundice. Laboratory studies confirmed cholestatic jaundice (see chart) and diagnosis of hepatic neoplasm was entertained. Chest x-ray and barium meal were normal. L.E. prep. was neg. x 3; Bun was 29 mgm%. Peritoneoscopy revealed a white liver swelling. A biopsy was taken through a small epigastric incision of the mass in the left lobe at the falciform ligament and was interpreted as subacute hepatitis (Fig. 1). He was placed on predisone 30 mgm/day and discharged on July 28, 1967.

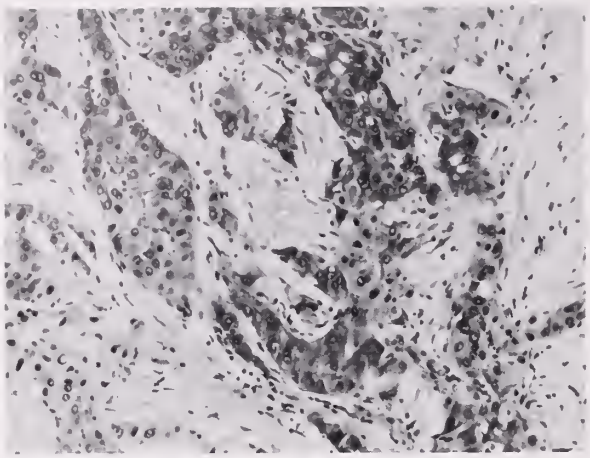

Fig. 1. The specimen of liver reveals the low grade hepatic cell carcinoma originally interpreted as hepatitis but eventually diagnosed as hepatoma.

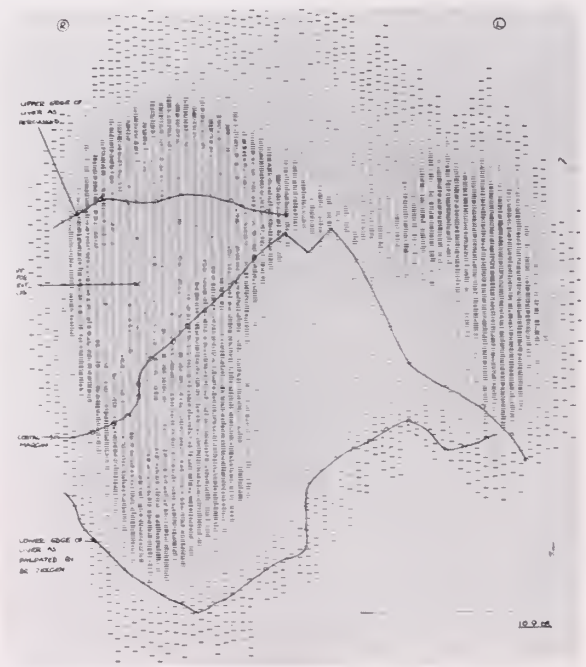

Fig. 2. Te^{99} liver scan demonstrates a cold area occupying the majority of the left lobe and no evidence of other space occupying masses, even though the right lobe is markedly enlarged.

After discharge, over the next fourteen months the patient remained intermittently jaundiced. The prednisone was continued at a low dosage. His weight dropped to 122 lbs, an additional 5 lbs. loss. The pale loose stools (2-3 a day) persisted but were never tarry. There was no colicky pain. Failure of improvement prompted review of biopsy and this was then thought to be consistent with a well differentiated malignant hepatoma with little mitotic acivity.

On September 9, 1968, he was admitted under the care of Dr. A. M. Dawson at St. Bartholomew's

Fig. 3. Coeliac angiogram demonstrating normal anatomic branches of coeliac artery and that the branches of the common hepatic artery are not involved with tumor. There was no tumor blush. The left hepatic artery is distorted and pushed to the right by the mass (arrow).

Hospital, for reassessment. Physical findings were jaundice and a hard irregular mass of liver which reached the right iliac crest and across the mid line to the left subcostal area. Within the left upper quadrant, the spleen was palpable two centimeters below left costal margin. Repeated liver profile studies showed low grade obstructive jaundice with moderately elevated transiminase levels (see chart). Laboratory studies: L.E. prep. neg. x 2, blood urea 37 mg/100, Na. 130 meq/1; K 3.6 meq/1; Cl 90 meq/1; Prothrombin Time 15 secs. Chest x-ray and barium swallow were normal. Radiotechnetium liver scan revealed a large cold area replacing the left lobe (Fig. 2). Coeliac arteriogram (Fig. 3) showed normal vascular anatomy and no pathological distortion of vessels. There was no evidence of tumor circulation.

On October 4, 1968, the patient was explored. An irregular mass occupied almost the entire left lobe of the large bile stained liver but the lesion was still half the size of the right lobe. The spleen was enlarged but soft. A transmesenteric portal venogram (Fig. 4) revealed obstructed left portal vein several millimeters from the bifurcation but no impingement on the right portal radicals. The portal pressure was 240 mm H_2O.

The gallbladder was distended; in addition the common bile duct was three centimeters in diameter and was felt to contain an impacted mass of soft smooth material. A transcholecystic cholangiogram (Fig. 5) revealed a normal gallbladder but a large filling defect within an enlarged duct. The mass originating from left biliary radicals was partly obstructing the right hepatic duct out flow.

Fig. 4. Operative portal venogram shows obstructed left portal vein 2-3 mm from bifurcation (arrow) and an intact right portal vein.

Fig. 5. Operative cholangiogram shows dilated gall bladder without stones and markedly dilated right hepatic duct. The common bile duct contains a large filling defect originating at the left hepatic duct (arrow). The defect reaches the lower third of the common duct at the 2nd lumbar vertebrae where the duct becomes smaller and dye freely enters the duodenum.

Choleducotomy revealed a tongue of tumor mass that was easily enucleated from the common bile duct wall. The right hepatic and common ducts were free from direct invasion of tumor. The right portal vein, the right hepatic artery and the right hepatic duct were therefore free from tumor invasion and left hepatectomy became a reasonable approach.

A right intercostal incision gave a thoroco-abdominal exposure. Left hepatic resection including caudate lobe was then begun by ligating the left hepatic vessels while identifying and preserving the right vessels, gallbladder and cystic duct. To remove the mass a small window at the entrance of the left hepatic duct was resected from the common duct. In order to get satisfactory margin around tumor, dissection of liver surface beyond the interlobar division included sacrifice of middle hepatic vein, and part of the wall of the right portal vein. The right hepatic vein was preserved and the left hepatic veins ligated. After the specimen was removed, the common duct was closed and drained by tube. The exposed liver surface was drained using corrugated rubber tubing.

The patient received Vit. K, intravenous 10 per cent Dextrose, albumin and antibiotics. Coagulation factors and electrolycytes were carefully monitored. A brief febrile episode was thought to be a sub-phrenic collection and this settled with additional antibiotics. He was maintained on low doses of steriods until they could be safely discontinued. He was discharged November 18, 1968 and seen on January 8, 1969. At that time liver functions were normal except for slightly elevated alkaline phosphatase (see chart). In July, liver scan showed no evidence of tumor in remaining liver.

LABORATORY STUDIES

	Bilirubin mgm %	Alk. P. King Armstrong	SGOT Units/ liter	Total Protein Grams %	Alb. Grams %	Hb. Grams %	WBC	ESR mm/hr.
3 6/67	T7.0 D5.1	37	—	6.8	3.7	10.9	5700	—
30 6/67	T7.7 D6.3	67	11	6.5	3.8	12.0	5200	61
10 7/67	T6.6 D6.3	40	66	6.9	4.0	12.3	6200	—
31 8/67	T9.0 D7.0	90	60	7.3	4.2	—	—	—
21 12/67	T10.0 D8.0	112	64	6.6	3.3	—	—	—
6 6/68	T2.6 D2.4	82	84	7.4	4.1	—	—	—
Admission 10 /68	T4.5	28	144	7.7	4.5	11.1	7300	69
2 10/68	T9.0	79	122	—	3.9	—	—	—
Post-op 8 1/69	T0.5	21	32	8.2	5.2	11.5	6300	13

Fig. 6. Resected specimen demonstrating the tongue of tumor that descended into the bile duct and the surface of division free of tumor. The wall of the right portal vein can be seen on this surface.

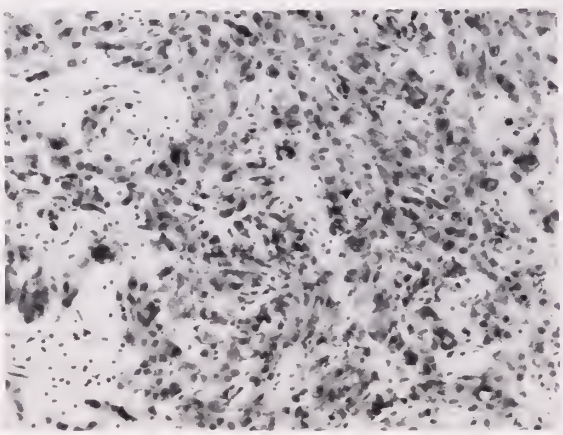

Fig. 7. Histologic specimen of tongue of tumor seen in Fig. 6.

The pathology revealed a bile stained specimen covered with a hard "morroco" leather surface weighing 1500 grams and containing a nodular tumor measuring 10 centimeters in diameter. This tumor had projected 5.6 centimeters into the left hepatic duct to form a smooth bile stained cast measuring 2.5 centimeters in diameter (Fig. 6). The mass in the duct on section consisted of a mixture of bile and tumor cells, surrounded by a thin wall of coagulum. The tumor was a low grade well differentiated hepato-cellular carcinoma continuous with the lobar primary and had invaded fat in porta hepatis. The lymph nodes contained no tumor. The changes in the surrounding liver were those of a secondary biliary cirrhosis.

Discussion

When neoplastic lesions involving the biliary tree produce obstructive jaundice, the origin of the primary lesion is largely extrahepatic (i.e. pancreas, bile duct or lymph nodes of porta hepatitis) and the cause of obstruction is therefore extra luminal.[17] Neoplasm within the biliary tree has been reported as a cause of obstructive jaundice.[8] An obstructive intrabiliary mass made up of necrotic carcinomatous cells and "chicken fat" was described by Edmonson[3] but no clinical details were given. Mallory discussed a patient who presented as obstructive jaundice and back pain[16] and at autopsy a hepatoma had invaded both cystic duct and 3rd lumbar vertebrae, but clot in the common bile duct was the only cause of the obstruction.

Some patients with intraluminal neoplasms present with the clinical features of hemobilia described by Sandblom.[25] Five such patients reached surgical investigation for obstructive jaundice. In a report by Rudstrom[24] two patients were explored for biliary colic, melena, anaemia and extrahepatic jaundice unexplained by stones. A 26-year-old farmer had five operations for these symptoms before the diagnosis of hepatoma was reached by finding neoplastic cells in the coagulum removed from the common bile duct; multiple liver biopsies revealed biliary cirrhosis; finally, at the last operation, the tumor was recognizable but unresectable. The other patient had metastatic malignant melanoma involving gallbladder; a mixture of tumor, bile and blood had plugged the common bile duct.

Fisher and Creed speculated that hepatic resection might be appropriate in cases of neoplastic hemobilia.[4] A 78-year-old male, received relief of colicky pain and jaundice by the removal of 5 centimeters clot from the common bile duct. Carcinoma was not suspected until malignant cells were found in the clot specimen. The patient died with subphrenic abscess and a resectable 5 centimeter hepatic cell carcinoma was found at autopsy.

Johns and Zimmerman[9] reported a 70-year-old patient whose obstructive hyperbilirubenemia was reversed by removal of intra biliary "clot" but he died later in liver failure. The diagnosis of carcinoma of the liver was found in histology of the clot.

Finally, Gerson and Schinella[17] in order to emphasize the difficulty of diagnosing interhepatic carcinoma during operation, presented a 54-year-old Chinese male, alcoholic with cirrhosis, obstructive jaundice and GI bleeding. On first operation, a large amount of "biliary mud" was removed from the common bile duct which was found to contain malignant cells. At re-exploration for GI bleeding for a gastric ulcer, still no tumor was found. At necropsy after death from overwhelming sepsis intraphepatic nodules of carcinoma within the right lobe were found.

Major hepatic resection when dealing with carcinoma of liver or biliary tract is unusual when the tumor presents by obstructing the biliary tree.[13,26] Foster et al resected en bloc the common duct and the left lobe of the liver in a 59-year-old with carcinoma of the bile duct.[5] Maloney[15] reported a 5-year followup of a right hepatic resection in an 18-year-old girl who presented with an obstructive jaundice; the bile duct was found to contain "cigar leaves" (presumably tumor) within the bile duct. To our knowledge, no other hepatic resection has been recorded where obstructive intraluminal neoplasm continuous with the primary was enucleated from the biliary tree.

To include the middle hepatic vein located in the interlobar fissure with the liver resection has been considered dangerous.[18] It has been pointed out that the middle hepatic vein drains the anterior superior segment of the right lobe and middle segment of the left lobe, and that if sacrificed, the left hepatic resection could end in fatal liver necrosis.[5] Adson and Jones[1] reported two patients where resections were carried beyond the interlobar fissure and wedges of opposite lobe were included in the resection. Intraoperative bleeding was the main hazard. One patient died of liver failure at nineteen days; the other survived over two years. In the present case haemorrhage was difficult to control along the bed of the middle hepatic vein until the specimen was finally resected. Then tributaries were oversown.

The management problems following major hepatic resection have been enumerated in detail elsewhere.[7,13,20] In this patient episodes of hypoglycemia, hypoalbumenemia and electrolyte depletion were avoided by administration of appropriate fluids in anticipation of these defects. Coagulation parameters remained normal throughout the postoperative course and the bleeding problems recorded with hepatic lobectomy[2] were not seen.

The results of hepatic resection for metastatic carcinoma[5,15] or invasive bile duct carcinoma[18,26] are of questionable value for long term results. However, the prognosis of surgical resection for primary hepatomas that are unrelated to cirrhosis can be encouraging because these tumors tend to be slow growing and unicentric.[3] Willis feels that the multiple sights of hepatoma result from metastatic spread by invasion of the portal and hepatic veins.[27] Martin and Woodman[11] attribute success in hepatic resections for cancer to the fact that the long term survivors (those at 6, 5 and 3½ years) had a low grade hepatoma. The 18-year-old patient reported by Maloney[16] has survived five years following what was probably an incomplete resection of hepatoma in the right lobe. Our patient is well at 19 months and has no evidence of recurrence.

Although the presence of obstructive jaundice in carcinoma of the liver may suggest neoplastic invasion beyond surgical resectibility, tumor involvement of the biliary tree may lend itself to operative removal together with a major hepatic resection. Decision for such an operation should be based on the knowledge of the type of tumor and its activity. In addition, the limitation of hepatic resection is dictated by the vascular anatomy of the liver and how much of this is involved with tumor. Spencer,[12] in a discussion, and McDermott[12] have shown how liver scan, celiac arteriogram and cholangiogram may aid in the diagnosis of the anatomic site of intra hepatic lesions. We feel that the additional information of a operative portovenogram clarifies the extent of the mass for resection.

Summary

A case of primary hepatoma is presented because the clinical features were overshadowed by those of obstructive jaundice caused by growth impacted into the common bile duct. Other cases of a similar nature are reviewed. Anatomic factors for resectibility were analyzed by celiac angiogram, portovenogram, cholangeogram and liver scan. The importance of these studies in operative judgment are presented. The success of hepatic resection for carcinoma also depends on the type of tumor and careful postoperative management. Obstructive jaundice in neoplastic liver disease does not eliminate surgical resectibility. •

Acknowledgment

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MATERNAL MORTALITY

The following cases have been reviewed by the Colorado Maternal Mortality Committee* and selected for publication because of their educational value.

Maternal mortality—Probable gram negative sepsis

THE HISTORY of Maternal Mortality Study Committees in the United States dates back to 1917 and the work of these committees has contributed significantly to the decline of maternal deaths. These Committees exist and function in each of the fifty states. Yet, so few have published reports of their activities that it was necessary for recent investigators to resort to a questionnaire to ascertain how and where these groups were functioning throughout the nation.[1]

It is the feeling of the Committee in Colorado that the research and actions of these groups should be reported. Therefore, beginning with this issue, the Colorado Maternal Mortality Committee will endeavor to keep all physicians in the Rocky Mountain area informed on the cases which we have considered. It is the sincere hope of this body that the case reports presented will help to further the best efforts of the profession towards an ever decreasing maternal mortality rate.

CASE REPORT

A 36-year-old, gravida V, para IV was admitted to the hospital emergency room July 10, 1969. Her admitting complaint was heavy vaginal bleeding of three to four hour duration. The patient presented as a short, 170-pound female with diabetes, fatty metamorphosis of the liver, hypertension, migraines and obesity. She had been taking oral contraceptives but this method was deemed unsafe due to her history and was discontinued.

On physical examination, the patient was found to be 12 weeks pregnant. The laboratory data was as follows: Blood pressure 100/60; pulse 100; hematocrit 31 per cent; temperature 99.2 degrees; white count 16,900; and the urine was free of acitone with a three plus sugar. Soon after admission her blood pressure could not be obtained but the admitting doctor reported that the patient was wide awake and appeared "quite well." The patient was treated with Dextran and Fibrinogen while the physician waited at least one hour for the laboratory to complete a blood cross match. The patient was given 1,000 cc. of five per cent Dextrose in water containing Keflin. Pitocin drip utilizing 90 units of Pitocin and three units of blood were used over the next several hours. "The patient remained alert and looked in excellent condition." Bleeding decreased, blood pressure rose and pelvic examination revealed a dilated cervix with no tissue presenting.

The patient went into shock later that evening and the vaginal bleeding was again profuse. She was given fluids and two units of blood. Her blood pressure rose to 140/90. It was then decided to do a total abdominal hysterectomy. The procedure took 90 minutes and was complicated by an enlarged liver and acitic fluid in the abdominal cavity. She received another three units of blood and 250 miligrams of Fibrinogen during surgery. "Post operative condition was good." She was also given gamma globulin. Her blood sugar was 314 miligrams per cent and hemoglobin 28 per cent.

The patient's condition worsened the following evening when she was again found to be in shock. There had been no urine output after surgery and although she was treated with intravenous Solu-Cortef, seven units of blood, and Vasoxyl, no blood pressure could be measured four hours later. An internist was called in consultation and recommended immediate digitalization as the electrocardiogram showed a sinus tachycardia. The attending physician felt there was a positive Cullen's Sign. The patient received Aramime and further blood replacement. She suffered intermittent convulsions and expired four hours later.

There was no autopsy done. The pathology report showed a uterus weighing 220 grams and measuring 2x7x6 centimeters. The cavity was filled with autolized placental fragments, however, there was no fetal tissue identified. The diagnosis was gravid uterus, probably incomplete abortion, and chronic cervicitis.

The attending physician diagnosed the case as vaginal hemorrhage with irreversible shock secondary to incomplete abortion, liver failure and fatty metamorphosis of the liver.

*The following physicians have been appointed to serve on the Maternal Mortality Committee, a subcommittee under Maternal and Child Health: Horace E. Thompson, Chairman, E. N. Akers, Maxwell A. Abelman, L. Joseph Butterfield, Warren E. Cooper, Gerald W. Del Junco, Lawrence W. Roessing, all of Denver; John H. Darst, Greeley; Harold L. Dyer, Colorado Springs; Richard R. Hansen, Fort Collins; Ronald E. Harrington, Boulder; James R. Patterson, Englewood; Louis C. Wollenweber Jr., Lakewood.

DISCUSSION

Because of the following aspects of this case the diagnosis of gram negative septicemia should also be considered, the slight elevation of temperature, the increased white blood count and the disproportionate shock to blood loss. One of the cardinal features of gram negative septicemia is a patient without discernable blood pressure who is responsive and alert.

Certainly massive intra-abdominal bleeding with "Cullen's Sign" is a strong possibility following the hysterectomy. •

Education Committee
Colorado Maternal Mortality
Committee

REFERENCE

[1] Marmol, J. G.; Scriggins, Alan L.; Vollman, Rudolf F.: History of the Maternal Mortality Study Committees in the United States. Obstetrics and Gynecology, 34:123-138, July 1969.

AMA Registry on Adverse Reactions Needs Information from Hospitals

The editors of the *AMA Registry on Adverse Reactions Due to Occupational Exposures* need the assistance of hospital medical staffs in collecting information on adverse effects resulting from new chemicals, biological or physical agents, or from exposure to old materials used in new processes. The *Registry* hopes to delineate newly recognized occupational disease manifestations. Physicians are urged to submit reports of single observations, from which the aggregate compilation may establish the probability of a causal relationship between a special exposure and an adverse effect.

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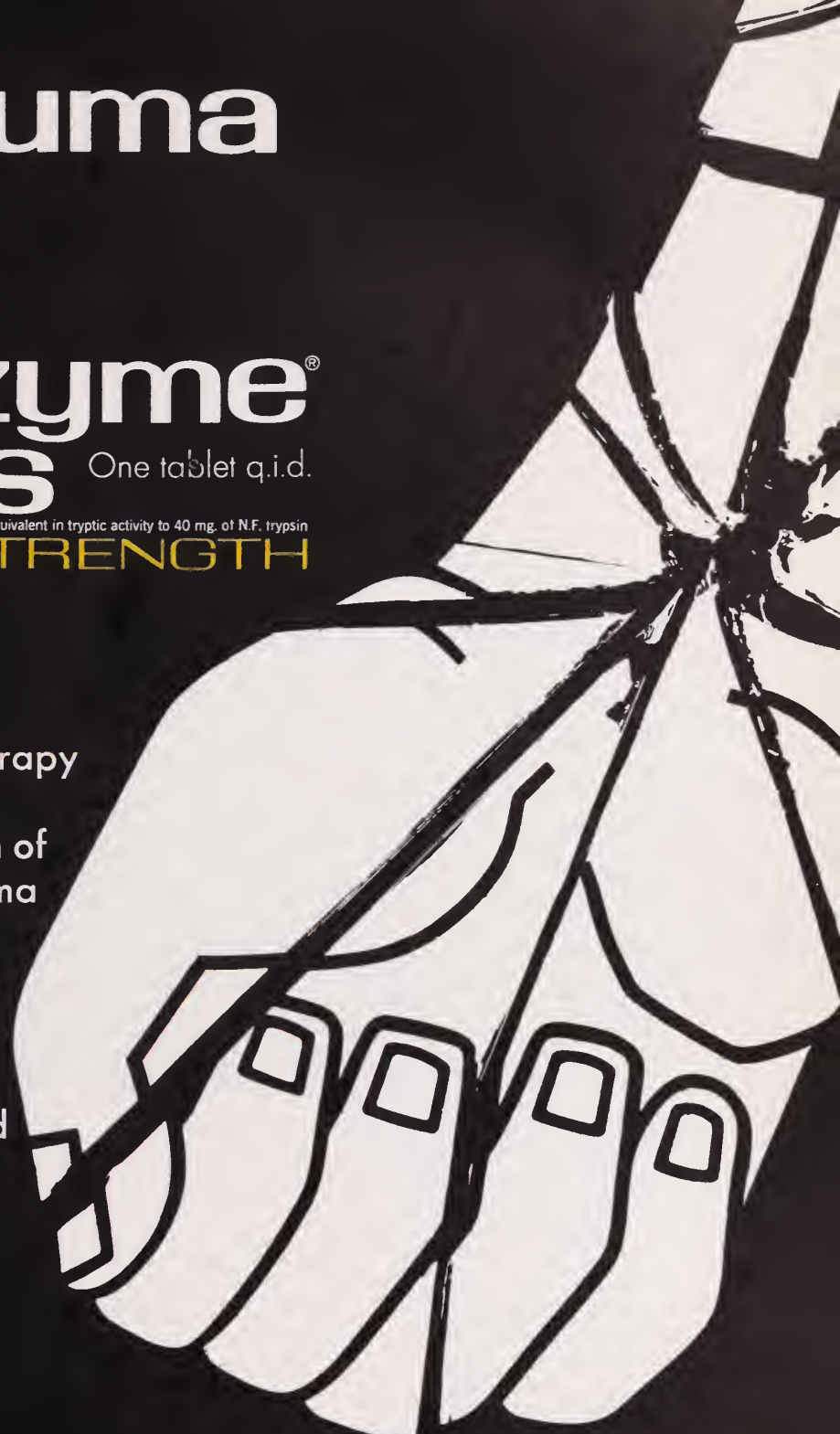

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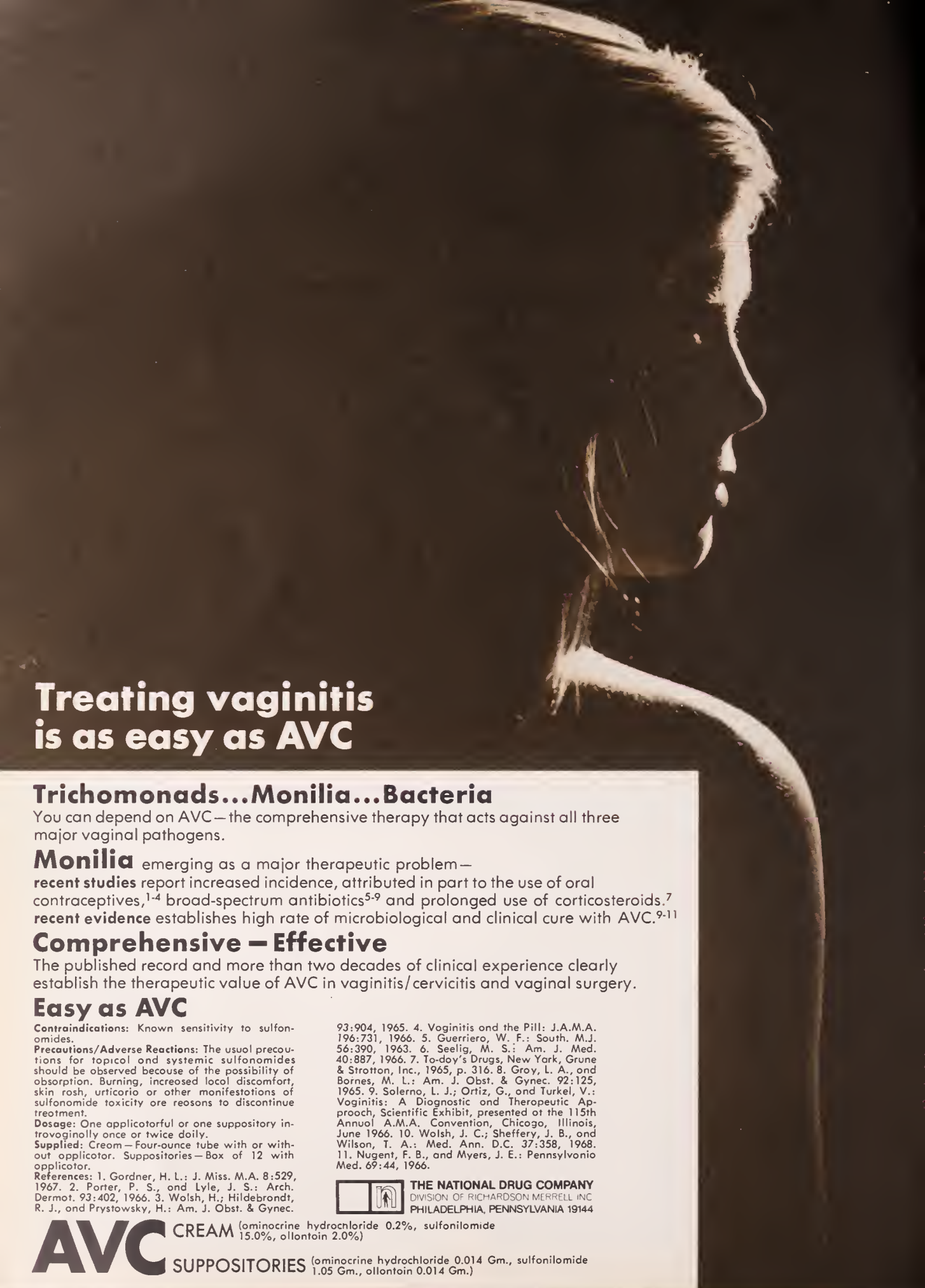

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References: 1. Gordner, H. L.: J. Miss. M.A. 8:529, 1967. 2. Porter, P. S., ond Lyle, J. S.: Arch. Dermot. 93:402, 1966. 3. Wolsh, H.; Hildebrondt, R. J., ond Prystowsky, H.: Am. J. Obst. & Gynec. 93:904, 1965. 4. Voginitis ond the Pill: J.A.M.A. 196:731, 1966. 5. Guerriero, W. F.: South. M.J. 56:390, 1963. 6. Seelig, M. S.: Am. J. Med. 40:887, 1966. 7. To-doy's Drugs, New York, Grune & Strotton, Inc., 1965, p. 316. 8. Groy, L. A., ond Bornes, M. L.: Am. J. Obst. & Gynec. 92:125, 1965. 9. Solerno, L. J.; Ortiz, G., ond Turkel, V.: Voginitis: A Diognostic ond Therapeutic Approoch, Scientific Exhibit, presented ot the 115th Annuol A.M.A. Convention, Chicogo, Illinois, June 1966. 10. Wolsh, J. C.; Sheffery, J. B., ond Wilson, T. A.: Med. Ann. D.C. 37:358, 1968. 11. Nugent, F. B., and Myers, J. E.: Pennsylvonio Med. 69:44, 1966.

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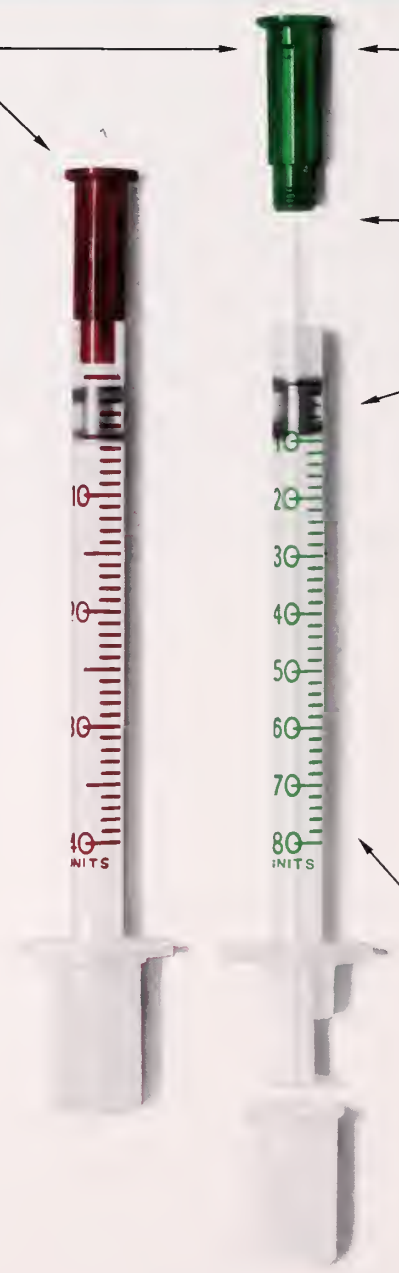

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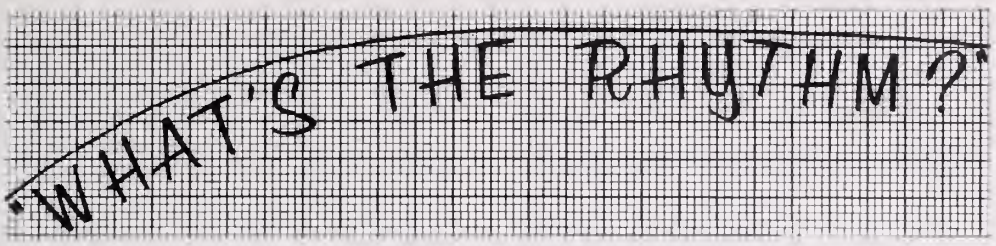
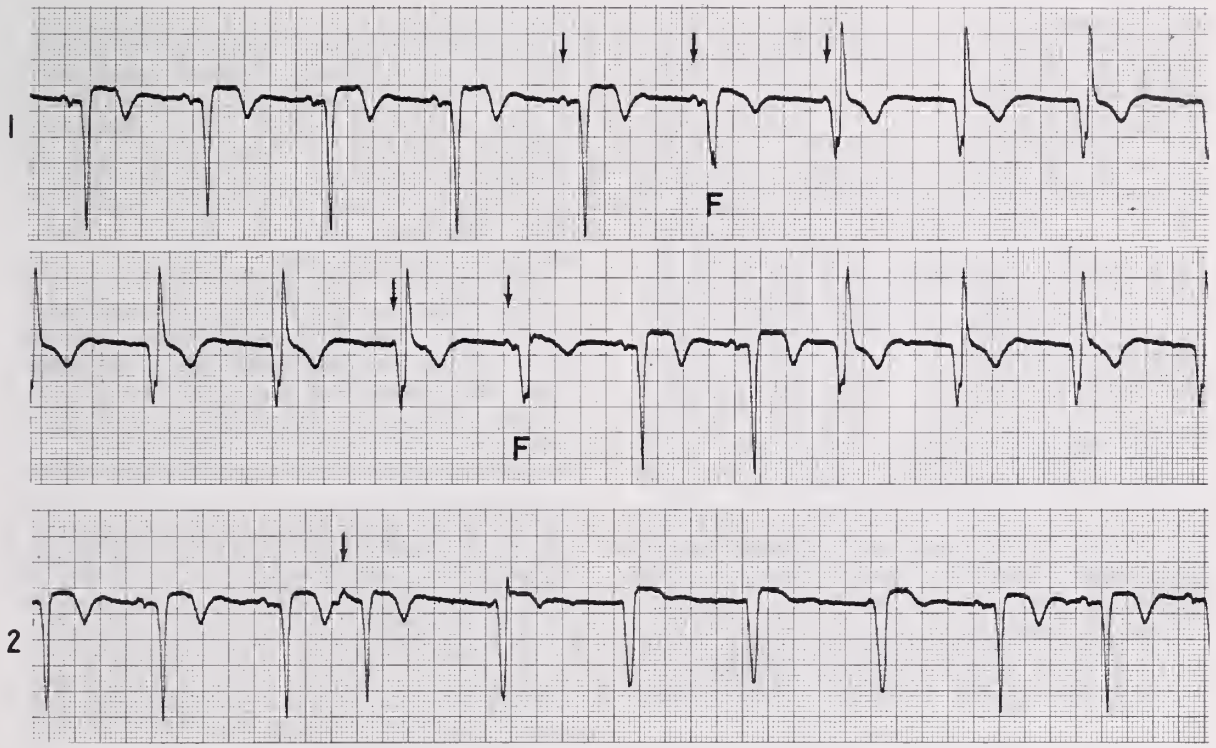


Prepared by Alan E. Lindsay, MD, Salt Lake City



THE PATIENT: A middle-aged male with acute myocardial infarction involving the inferior surface of the heart. At the time these tracings were taken he had been in the hospital approximately 12 hours and was receiving no cardiac medications.

THE TRACINGS: The tracings were obtained with bipolar chest electrodes so placed as to simulate lead V_1.

Tracing 1 (two continuous strips) shows an alteration in QRS morphology in the middle of the top strip without a change in rate. At the beginning of this strip we see that the patient is in normal sinus rhythm. The first arrow indicates slight SA node slowing; following this beat the PR interval becomes shorter, and the QRS complex changes to a right bundle branch block morphology. The P-waves are "swallowed up" in the QRS complexes but are seen emerging from the QRS at the time of the first arrow in the second strip and regain control (resumption of normal sinus rhythm) with the sixth QRS complex in the second strip. Later in the second strip this rhythm returns, this time however with a slightly premature QRS complex. Note that the sinus rate and the rate of the ectopic rhythm are almost identical.

Several minutes later Tracing 2 was obtained. The arrow indicates a premature P-wave followed by a QRS (premature atrial extrasystole). After the post-extrasystolic pause a slightly slower rhythm with QRS morphology suggesting left bundle branch block is seen for four beats, again with AV dissociation. The P-wave reappears in front of the fourth beat of this episode and the SA node resumes control of the heart toward the end of the tracing. Note that the rate of the ectopic rhythm is exactly the same as in Tracing 1 where right bundle branch block morphology was observed.

INTERPRETATION: Because of slowing of the dominant pacemaker (sino-atrial node slowing in the first tracing and a post-extrasystolic pause in the second) a broad QRS complex rhythm is seen, quite clearly indicating that some lower ectopic pacemaker has taken over control of the ventricles. The atria continue beating in an independent manner so that there is AV dissociation—that is, the atria and ventricles are controlled by separate pacemakers. During the beginning and end of the paroxysms of abnormal ectopic rhythm in Tracing 1 fusion beats (labelled 'F") are seen, indicating simultaneous activation of the ventricle by both pacemakers.

Because of the broad QRS complex of the ectopic rhythm and particularly because of the presence of fusion beats it is generally assumed that this ectopic rhythm is ventricular in origin and arises from the terminal Purkinje network in the ventricles. Several observations suggest that this may not be the case. The rate of 63 is close to the usual pacing rate of the AV junction and is much faster than the ordinary pacing rate of the terminal Purkinje fibres (as might be seen in the slow idioventricular rhythm in complete AV block). In the present case the fact that the ectopic rhythm may have either right bundle branch block or left bundle branch block configuration strongly suggests that the origin of the ectopic rhythm is indeed above the bifurcation of the bundle of His and thus qualifies as an AV junctional pacemaker. It apparently has alternative routes of ventricular stimulation and can utilize either the right or the left bundle branch depending upon other circumstances.

THE IMPLICATION: Many names have been given to this particular type of rhythm, most commonly "idioventricular rhythm." Other names consist of "slow ventricular tachycardia" and "accelerated idioventricular rhythm". We object to this nomenclature because it is by no means certain, as indicated above, that this rhythm is ventricular in origin. It is commonly seen in patients with acute inferior myocardial infarction and is usually transient and repetitive over a 24-hour period. An important thing to remember about this rhythm disturbance is that it is entirely benign and does not lead to such catastrophic events as ventricular tachycardia or ventricular fibrillation. Each paroxysm usually lasts less than 15 seconds and will frequently appear whenever the normal sinus rates slows for one reason or another. It calls for no special therapy. Unfortunately its observation often leads to unwise therapy such as the administering of anti-arrhythmic drugs to abolish or prevent it. This is entirely unnecessary and, indeed, very frequently unsuccessful. When seen with slow sinus rates below 60 beats/minute, Atropine, by increasing the SA node rate, will frequently abolish the ectopic rhythm.

COMMENT: Because of its benign nature this rhythm may be safely ignored by the clinician who is doing continuous monitoring on patients with inferior mycardial infarction.

If this rhythm is AV junctional in origin, and there is much evidence to suggest that it is, the presence of fusion beats is of great interest. They probably result because of dual conduction pathways within the AV junction so that the ventricles can be simultaneously activated by two separate supraventricular foci. Their merging at the ventricular level then produces fusion beats. •

Reference: Rothfeld, E. L.: "Idioventricular Rhythm in Acute Myocardial Infarction," Circul. 37:203, 1968.

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The acid-base surface

A 3-Dimensional Visual Model

N. Balfour Slonim, MD*, and N. Karen Estridge**, Denver

A new model for better understanding of acid-base chemistry and for analysis of acid-base information.

ACID-BASE CHEMISTRY IS important for both basic and applied medical science. In medical schools responsibility for teaching this subject is often divided among departments of biochemistry, physiology, and clinical medicine, each department assuming that the other two are succeeding. However, experience shows that it is usually difficult for the student to grasp this subject and that many do not develop a *working* knowledge of acid-base chemistry. We now monitor clinical problem cases with serial close-interval acid-base blood studies and will soon have continuous on-line determination of pH and P_{CO_2}. We submit that clinical acid-base problems are not sufficiently understood. We further submit that currently available acid-base models are inadequate for present, much less future, needs.

Criteria for a better acid-base model are as follows: it should be (1) readily comprehensible; (2) accurately quantitative; (3) useful for analysis of the *dynamics* of acid-base change as well as for the conventional *static* analysis of acid-base status; (4) capable of simultaneous display of three continuous variables and (5) economically feasible.

Despite intensive re-examination, the Henderson-Hasselbalch equation remains the fundamental relationship of acid-base chemistry. This equilibrium equation expresses acid-base status in terms of the important carbonic acid-bicarbonate blood buffer system:

$$pH = 6.10 + \log_{10}\frac{[HCO_3^-]\ \text{plasma}}{0.0301 \times P_{CO_2}}$$

The many attempts to render this algebraic expression comprehensible include tables, nomograms, each of the three possible 2-dimensional cartesian graphs, slide rules, and analog computers programmed to calculate it. Thus far, these approaches have been neither intellectually satisfying nor especially successful.

At any given time, the Henderson-Hasselbalch equation contains *two independent variables* (two degrees of freedom), the third variable depending upon the other two. *Physiologically*, pH is a totally *dependent* variable since it can only be altered by means of changing P_{CO_2} or $[HCO_3^-]$. However, from time to time, *therapeutically* or *experimentally*, any pair† of the three variables can vary independently. In this sense the Henderson-Hasselbalch equation contains (at various times) *three* independent continuous variables. Thus, to provide a better visual model and conceptual framework for the physiologic facts and clinical data of acid-base chemistry, the Henderson-Hasselbalch equation must be represented in 3-dimensional form.

If we assign suitable scale values within the physiologic ranges of the three variables ——pH, P_{CO_2}, and $[HCO_3^-]$——then the three respective axes form a relevant acid-base cube in the first octant. The three 2-dimensional graphs (Figure 1——A, B, and C) are the three faces of this cube. (A certain projection of this cube onto a plane is familiar as a regular hexagon.) The approximate

*Director and **Cardiopulmonary Technologist, Cardiopulmonary Diagnostic Laboratory, 2045 Franklin St., Suite 918, Denver.

†There are three possible pairs of three things taken two at a time.

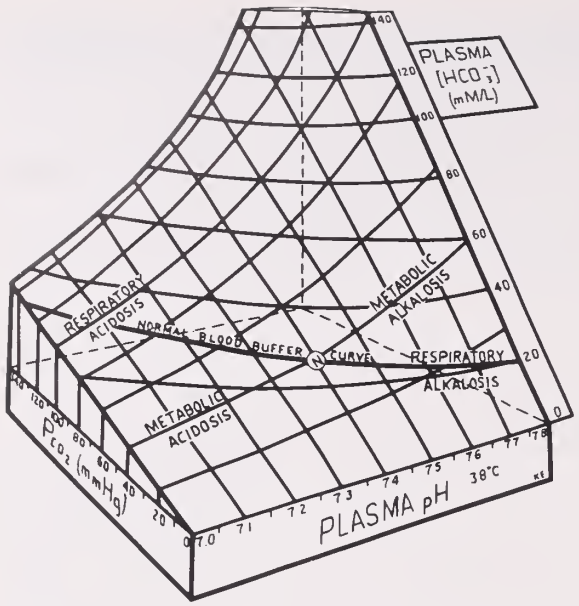


Fig. 2. The Acid-Base Surface is a 3-dimensional plot of the Henderson-Hasselbalch equation for use in analysis of acid-base information. The three continuous variables are represented on a triaxial rectangular cartesian coordinate system. The surface is engraved with color-coded pH, P_{CO_2}, and $[HCO_3^-]$ isopleths as well as reference points for blood. Ranges and scales are so chosen that the 3-dimensional surface is inscribed within the physiologically relevant acid-base cube.

Although P_{CO_2} values of less than 10 mm Hg are almost unknown clinically, this region is included in the Acid-Base Surface for structural continuity. The single line $P_{CO_2} = 0$, although having no mathematical existence (division by zero is algebraically undefined), is also included for structural continuity.

Color-coded isopleth lines showing incremental steps for each of the three variables are engraved in the plastic surface. For any constant pH the value of the ratio $[HCO_3^-]/a \times P_{CO_2}$ and thus also the value of its logarithm remain constant. As pH ranges from low to high a set of straight lines of progressively increasing slope is generated. These straight lines, originating in the pH axis at the theoretical line of intersection of the planes $P_{CO_2} = 0$, $[HCO_3^-] = 0$, are the simplest geometric feature of the Acid-Base Surface. Lines in the surface connecting points of equal pH (pH isopleths) are thus straight; those connecting points of equal P_{CO_2} (P_{CO_2} isopleths, or isobars) and those connecting points of equal $[HCO_3^-]$ (bicarbonate isopleths) are both exponential.

~~60~~
61

FOR CORRECTION
SEE p. 24 # 9

We now consider the acid-base properties and behaviour of blood. The normal point Ⓝ for arterial blood of healthy resting man at sea level is indicated in the surface at pH = 7.40‡, P_{CO_2} = 40 mm Hg, and $[HCO_3^-]$ 24 mM/liter. Other reference points for blood, including the normal blood buffer curve and the four areas of primary acid-base disturbance, are also shown.

The Acid-Base Surface is also a geometric solution of the Henderson-Hasselbalch equation. Every point in the Acid-Base Surface has coordinate values for each of the three Henderson-Hasselbalch variables. Plotting the measured or assigned values for any two of the three variables in the surface automatically implies the value of the third. The chemistry and solid analytic geometry of the Henderson-Hasselbalch buffer equation thus provide the reference system in terms of which we can observe and analyze the dynamics of acid-base physiology.

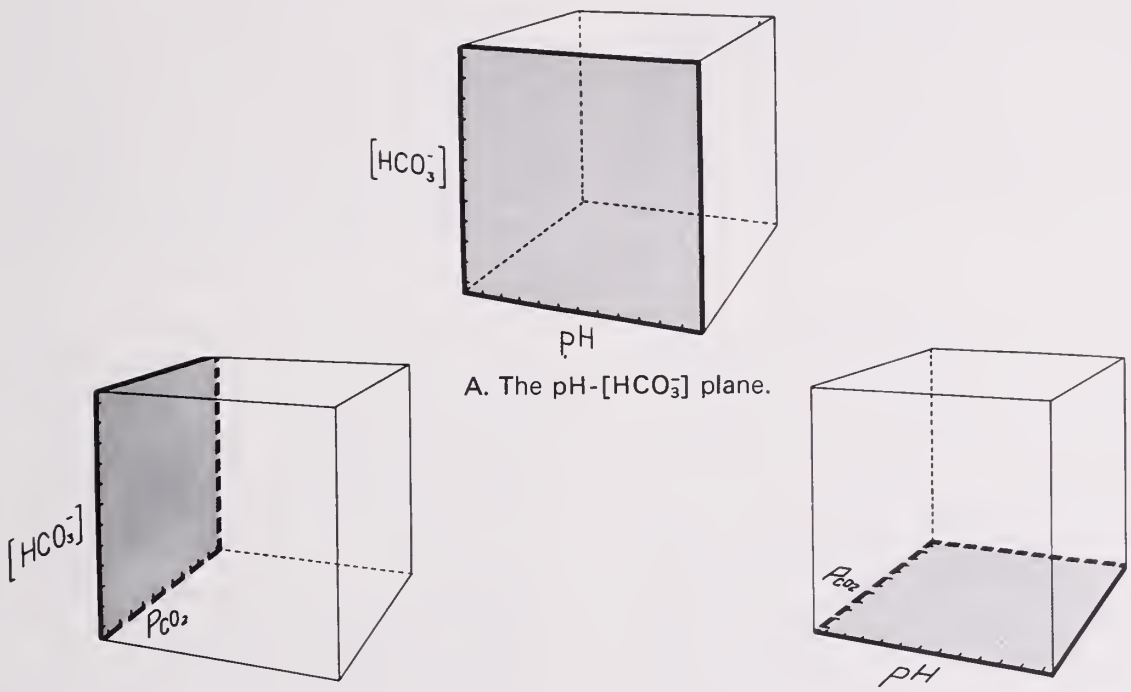
Acid-base status can be displayed and diagnosed on the model; both nature and extent of any acid-base change——physiologic or pathologic——can be seen at a glance. Pathways of acid-base disturbance and compensation or recovery can be followed visually. Examples of acid-base change due to physiologic processes, drugs, or disease can also be visualized.

The Acid-Base Surface has important advantages over the conventional 2-dimensional graphs. Approximations or distortions customarily present in the conventional presentations are unnecessary with an accurate 3-dimensional geometric plot of the 3-variable Henderson-Hasselbalch equation system. For example, the actual 3-dimensional shape of the blood buffer curve is instructive to those who have known only straight-line approximations of its projection in the pH-$[HCO_3^-]$ plane. The pH-P_{CO_2} planar projection of the blood buffer curve is exponential. Thus, a log-linear re-plot of this projection would give a straight line.

Although it can be said that a 3-dimensional surface is inherently no more *accurate* than the projection of that surface onto a 2-dimensional coordinate system, such a projection results in a complex distortion of the

‡Blood pH means plasma pH.

FIGURE 1



The three diagrams – A, B, and C – show the relationship of each of the three conventional 2-dimensional planar projections to the 3-dimensional rectangular coordinate system – the acid-base cube.

tolerance ranges for pH and P_{CO_2} are related by a common metric —— the edge of the cube. For any constant temperature, the Henderson-Hasselbalch equation can now be represented physically (plotted) in this triaxial coordinate system, inscribing a 3-dimensional surface within the physiologically relevant cube. The Acid-Base Surface (Fig. 2) is thus a 3-dimensional rectangular cartesian plot of the Henderson-Hasselbalch equation.

Values on the pH axis range from 7.00 to 7.80 with scale division steps of 0.05 unit; values on the P_{CO_2} axis range from 0 to 150 mm Hg with scale division steps of 10 mm Hg; and values on the vertical plasma $[HCO_3^-]$ axis range from 0 to 150 mM/liter with scale division steps of 10 mM/liter. The Acid-Base Surface thus contains all possible points of acid-base status compatible with life.

Although the extreme high value for $[HCO_3^-]$ implied by the combined values pH = 7.80 and P_{CO_2} = 150 mm Hg is 226 mM/liter, the Acid-Base Surface is amputated at $[HCO_3^-]$ = 150 mM/liter to form a cubic system. Even so, it still includes a region of high $[HCO_3^-]$ that is only useful under certain unusual conditions, e.g., bicarbonate infusion. However, inclusion of this region of high $[HCO_3^-]$ facilitates visual appreciation of the geometric shape and mathematical nature of the surface.

FOR CORRECTION
SEE p. 24 #9

3-variable relationship and is absolutely incapable of showing the true *continuous* nature of the third variable. The 3-dimensional presentation of a 3-variable problem is thus simpler, as well as easier to appreciate and comprehend.

It can also be said that the expedient of representing the carbonic acid-bicarbonate buffer system geometrically in 3-dimensional space rather than in conventional 2-space yields no new information and no new insights. However, it accomplishes something much more important——it renders acid-base information more comprehensible and thus more useful to many of us who are visual-minded.

The effect of changing P_{CO_2} can be visualized. The Henderson-Hasselbalch equation implies that any single value of P_{CO_2} corresponds to a whole set of pH-$[HCO_3^-]$ coordinate value combinations, constituting a P_{CO_2} isobar. The relationship of pH and $[HCO_3^-]$ to changing P_{CO_2} can also be deduced. Physiologically, blood buffer capacity (the slope of the blood buffer curve) imposes a second condition upon the 3-variable relationship, defining the particular manner in which plasma pH and $[HCO_3^-]$ values change during the titration of blood with CO_2. Such a titration curve, showing the effects of increasing or decreasing P_{CO_2}, is seen in the Acid-Base Surface as the 3-dimensional blood buffer, or CO_2 dissociation, curve. Note that every respiratory acid-base change is a 3-variable problem.

The effect of changing hemoglobin concentration can be visualized. Both polycythemia and anemia change the *slope* of the blood buffer curve. A simple increase of hemoglobin concentration results in a steeper curve that still passes, however, through the normal arterial blood point. With anemia the slope is decreased. Both changes may be visualized as a rotation of the blood buffer curve about the normal arterial point. Because of its hemoglobin content, the buffer capacity of whole blood is always greater than that of its plasma. Thus, although having a common initial acid-base point, a whole blood buffer curve resulting from titration with CO_2 is steeper than that for its plasma.

The effect of changing oxyhemoglobin saturation can be visualized. Oxyhemoglobin is a somewhat stronger acid than reduced hemoglobin, and its desaturation shifts any given blood point up and to the right, producing a slight metabolic, or non-respiratory, alkalosis (Haldane effect). Oxyhemoglobin desaturation, a change of greater clinical importance than the reverse, can thus be visualized as giving a blood buffer curve that is to the right and higher, but parallel to, the normal curve. The acid-base changes associated with pulmonary and systemic capillary gas exchange as well as other acid-base information and ideas can be visualized as points or movements within the Acid-Base Surface.

Because of current interest in the physiology of hypo- and hyperthermia, methods are being developed to display the effects of body temperature as a fourth variable. Any constant temperature implies a particular acid-base surface, depending upon the values for the Henderson-Hasselbalch constants a and pK'_1. Thus, as temperature varies, an acid-base volume is generated. Further development of the Acid-Base Surface will include an electronic Acid-Base Simulator——a computer programmed to display typical pathways of acid-base disturbance and recovery or compensation, including the time relationships——and an Acid-Base Monitor for immediate display of acid-base status and dynamics in the intensive care unit. The latter application awaits development of satisfactory on-line sensors for continuous measurement of pH and P_{CO_2}.

The Henderson-Hasselbalch equation may also be plotted in a triaxial rectangular cartesian coordinate system using $[H^+]$ instead of pH. This gives a 3-dimensional surface that is functionally (mathematical sense) different from, but topologically similar to, that described above. Thus, isopleths are straight lines for both $[H^+]$ and $[HCO_3^-]$, and rectangular hyperbolas for P_{CO_2}.

Summary

The Acid-Base Surface is an accurate 3-dimensional plot on rectangular cartesian coordinates of the fundamental relationship of acid-base chemistry —— the Henderson-Hasselbalch equation. As such it is a unifying

synthesis of the three possible 2-dimensional representations of this equation, all of which are in current use. It contains color-coded pH, P_{CO_2}, and $[HCO_3^-]$ isopleths as well as reference points for blood. Scales and ranges are so chosen that the 3-dimensional surface is inscribed within the physiologically relevant cube. Approximations and distortions customarily present in the conventional 2-dimensional models are unnecessary with an accurate 3-dimensional geometric plot of the 3-variable Henderson-Hasselbalch equation system. The Acid-Base Surface model facilitates discussion of various acid-base concepts and terminologies. Acid-base status as well as pathways of disturbance and compensation or recovery——whether the result of drugs, disease, or physiologic processes——can be visualized. The acid-base significance of anemia, polycythemia, and oxyhemoglobin desaturation can also be visualized. It can be adapted for use with any kind of vertebrate blood or, for that matter, for use with any carbonic acid-bicarbonate buffer system. The Acid-Base Surface is of value as a 3-dimensional graphic presentation of relevant parameters for study and clinical analysis of acid-base information, providing the student with a fundamental visual model and conceptual framework. •

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Highway safety requires safe highways

Horace E. Campbell, MD*, Denver, Colorado

"I PROPOSE THAT our highway system design and operating practice is precisely that which we would have built if our objective had been to kill as many people as possible." Regretfully, this author cannot lay claim to this statement which he considers the most important and definitive statement yet made in the field of traffic safety. After all, a moment's reflection will reveal surely that the basic and fundamental parameter in our quest for traffic safety is the design and construction of the highway itself. As one who has almost literally grown up with the automobile, and early developed a life-long "passion" for this marvelous machine, this author has a most vivid memory of the clogging mud and smothering dust of our early highways, and yet agrees completely with our opening statement, and regrets he did not have the insight and perspicacity to make it himself.

Mr. Kenneth A. Stonex, currently Executive Engineer, Automotive Safety Engineering, and formerly Assistant Director, General Motors Proving Grounds, made this statement early in February, 1965, during A Colloquy on Motor Vehicle and Traffic Law.[1] In earlier publications,[2,3] Mr. Stonex described in careful detail what he and his colleagues at the Proving Grounds consider a safe road to be. A movie describing the design and operation of the durability testing roads at the Proving Grounds was made and enough copies sent to the Bureau of Public Roads for each State Office of the Bureau to have a copy.[4] Hence, it can be stated unequivocally that our highway officials *know* the specifications of a safe highway.

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At its inception in 1924, the durability testing roads of the Provings Grounds were one-way roads with no intersections. There are no head-on crashes. To achieve comparable safety on our nation's roads, Mr. Stonex recommends flat and traversable medians at least 150 feet wide and preferably 200 feet. The original Design Standards adopted July 12, 1956 by the American Association of State Highway Officials for our new Interstate System stated "medians shall be at least 36 feet wide" and "The usable width of shoulders shall be not less than 10 feet." Most of the roads built in the following years did not exceed these minimum specifications.

The Pennsylvania Turnpike was opened in 1940 with ten-foot medians, and quickly demonstrated the frequency with which cars crossed this narrow median. By 1955, one-third of its fatal accidents, and 42 per cent of its deaths were charged to head-on collisions caused by cross-overs. Were these facts not known to the American Association of State Highway Officials when it issued its standards in 1956? Surely every highway engineer in the country knew that a car going out of control at 70 mph can cross a 36-foot median in as little as one-half a second, depending upon the angle of deviation. The Pennsylvania Turnpike authorities were finally persuaded in 1962 to build a steel median barrier, when the fatality rate was 3.7 per 100 million vehicle miles. In 1965, the first year after completion of the barrier, the death toll had declined to a record low of 1.5.

The 36-foot median is very much better than a 10-foot median, for several studies have shown that about 80 per cent of drivers

can regain control of their car in 33 feet from the roadside, and 90 per cent in 50 feet. The 20 per cent of drivers who cross the 36-foot median and enter the opposing traffic lane account for the not inconsiderable number of cross median fatalities still occurring on our Interstate highways. It is a matter of record, however, that not every car which crosses the median, is involved in accident; depending upon the traffic density, as many as four out of five cars cross the opposing traffic lanes at a vacant period. It is something of a gamble, like Russian roulette.

Despite the excellent safety record of General Motors' one-way roads, the highly trained and selected test drivers were going off the road every 240,000 vehicle miles during the six years 1952 through 1958, with 64-man days lost due to injury.[5] In 1954 Stonex remarked, "As long as obstacles exist, some drivers will hit them, and the safety of the design should be in direct proportion to the time the driver has available between making his error and striking the obstacle."[6] In the following six-year period through 1964, following the virtual completion of the roadside improvement program, the off-the-road frequency was about the same, but not a single day was lost due to injury in these accidents.[5] In his 1965 statement, Mr. Stonex wrote, ". . . has shown no personal injury off-the-road accident for the last 80,676,724 miles." A personal communication reveals that as of January 1, 1970, there has been one off-the-road injury in 196,000,000 test miles.

The minimal specifications for the GM roads: "There is a 10-foot shoulder, the ditch slope and fill and backslopes are a maximum of 6:1, there are 6½-foot vertical curves with 40-foot radius at the bottom of the ditch, and the roadside is clear of all obstacles for a minimum of 100 feet on each side of the centerline . . . we take care to maintain the roadsides, so they are traversable."[3]

On roads designed, constructed, and maintained as described and as in actual practice at Milford, Michigan, fatal accidents would almost never occur and injuries would be very rare. Mr. Stonex has said that it is impossible to build a car which can hit a big tree with impunity; it is simpler to remove the trees. And this goes for non-frangible lamp posts and bridge abutments. On our Interstate highways we regularly see a heavy bridge pier in the median. On the GM Proving Grounds, when a comparable situation was encountered, it was thought best to spend another $20,000 to provide a wide-span bridge, and to eliminate the central pier, even if only one accident per 100 years were prevented.[4] Many of the bridge piers on the right and the left have been photographed as unprotected by guard rails.

General Motors Proving Grounds engineers have made realistic appraisals of guard-rails[7,8] and have concluded that guard-rail is a last resort, when nothing else can be done. Hence, a wide-span bridge with no median pillar and no guard rail is far safer than a bridge with a median pillar which must have a guard rail.

This having been said, it is this writer's immutable opinion that all the Interstate roads with 36-foot medians or narrower should have a guard-rail down the center of the median, if the two roadways are on the same grade, or a guard-rail for each roadway if the median cross grade is steeper than

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6:1. Also, if the grade to the right of the ten-foot shoulder is steeper than 6:1, a guard rail must be placed at the right edge of the shoulder. In a careful study of the fatal accidents on some of our Interstate highways, it is distressing how many fatal roll-overs, in both the 36-foot median and off the right side of the road—more than the fatal cross-overs—are occurring. Without making a study of the slopes at the sites, it would seem most likely that these surfaces have slopes steeper than 6:1.

Now, there are guard rails and guard rails. For a 10-12 foot median, the writer thinks the New Jersey concrete median barrier is perhaps the best choice; for the customary Interstate 36-foot median, the New York box beam barrier would seem ideal. If these roads can be re-cast, with the current pair of two-lane roadways converted so that they together are a one-way roadway, then the ideal solution is to erect the other direction roadway at least 150, preferably 200, feet away, and a pair of safe one-direction roads has been created. There are many areas where right-of-way has been obtained and traffic needs call for precisely this solution.

Many of the current Interstate roads can be arranged with 100-foot deceleration zones on the right, and with level medians on the left, and the excellent box-beam barrier down the middle of the median, to become far more safe than they are now. Write your Congressman about this; the Federal Government is paying 90 per cent of the price, and will help you get the safe road that the expenditure demands.

The most dangerous roads are the old two-lane horse and buggy roads, paved to be sure, with buses, heavy tractor trailers, and trucks, representing millions of foot-pounds of kinetic energy, passing each other at 55-60 mph, separated by a 6-inch stripe of paint on the highway, and this an intermittent stripe, indicating that passing is permitted. And it is on these roads that the vast preponderance of our annual vehicle miles are laid down. Can anyone doubt the stark accuracy of Mr. Stonex' opening statement?

The solution for these roads is as simple as removing the big trees from the roadside, i e., make them one-way roads, and as quickly as possible, provide wide deceleration lanes, flat, traversable, and 100-feet wide, on either side. You will be told that this is impractical, there are no near-by roads to become one-way roads in the other direction. The practicality of a road of this type has been daily demonstrated at Milford, Michigan, since 1924. A near-by road as far as 25 miles away will be far better than the way we are doing it now.

The fatality and injury rate on the General Motors Proving Grounds road system is 25 times (2500 per cent) better than the performance on our national road system.[4] Again, the credibility of Mr. Stonex' provocative statement becomes ever more reliable. On the roads suggested, even the drunken driver, responsible for more than 50 per cent of our fatal accidents, becomes almost harmless. Finding himself in the middle of a 150-foot median or at the shrubbery edge of a 100-foot deceleration zone, he is likely to turn off his lights and sleep it off till morning. Hopefully, the State Patrol will soon find him, for his car is a dangerous obstacle, but not nearly as dangerous as it was when in motion.

Our cars will get better, our drivers will not get any better, they may even become worse, but it is the planar and topographical characteristics of our roads which will determine whether we have more or fewer deaths and injuries on our highways. •

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NATIONAL AFFAIRS

Summary of Actions of
The House of Delegates
American Medical Association
119th Annual Convention
Chicago, Illinois
June 21-25, 1970

In its first uninterrupted Annual Convention since 1967 (thanks to the most elaborate security precautions ever taken), the House of Delegates considered a record volume of business; passed a hotly debated statement on abortion; raised membership dues to help finance needed programs; heard outgoing President Gerald D. Dorman challenge the Association to attain and maintain a specific minimum health standard of "a healthy child and a healthy mother;" and applauded newly inaugurated President Walter C. Bornemeier's call for greater emphasis on patient care through an overhaul of medical education and training.

Elections

Of major importance to the Rocky Mountain states was the successful election campaigns of two of our physicians. Wesley W. Hall, MD, of Reno, Nevada, was named President-elect following nine years service as a member of the AMA Board of Trustees, two of which as Chairman of the Board. Kenneth C. Sawyer, MD, of Denver, Colorado was elected to the Board of Trustees of the AMA.

H. Thomas McGuire, Delaware, was elected Vice President and Russell B. Roth, Pennsylvania, and J. Frank Walker, Georgia, were unanimously re-elected to their posts as Speaker and Vice Speaker of the House, respectively.

Besides Dr. Sawyer, John H. Budd, Ohio; Richard E. Palmer, Virginia; and James H. Sammons, Texas, were elected to fill the four vacancies on the Board of Trustees.

George W. Petznick, Ohio, was re-elected to the Judicial Council.

M. Louise C. Gloeckner, Pennsylvania, was elected to the Council on Constitution and By-Laws.

Warren L. Bostick, California, and Bernard J. Pisani, New York, were elected; and Bland W. Cannon, Tennessee, was re-elected to the Council on Medical Education.

Paul W. Burleson, Alabama, was elected; and Donald R. Hayes, Massachusetts, and W. B. Hildebrand, Wisconsin, were re-elected to the Council on Medical Service.

Final Report and Inaugural Address

In his final report to the House, Gerald D. Dorman reminded the profession that "We expect to be recognized and accepted as the leaders of medical and health care planning and action . . . because our experience has made us the best qualified to give leadership in medical care. But if we are to continue in that position, we must earn it. We must deserve it, not because of reputation or tradition, but because of visible achievement. . . ."

After repeating his hope (first stated in Denver) that the 1970's would be the Significant Seventies in medical and health care, Dr. Dorman said, "I should like to set a specific minimum health standard for the American Medical Association to attain and maintain. That is a healthy child and a healthy mother. This does not require a resolution of this House; it does not require legislation or funding. It only requires personal dedication and commitment.

"Already this is being carried out in many places that I know of, and surely in many that I do not. Already the infant and maternal death rates are falling, but I speak also of infant and maternal morbidity. There are lives of mothers and of children permanently damaged for lack of proper care. This is not necessarily a fault of organized medicine because poverty, ignorance, malnutrition and bad sanitation take their toll. These we, as crusading citizens, must overcome now, as leaders in our drive for a healthy child and a healthy mother. . . .

"I want to see all our physicians—our obstetricians and gynecologists, our pediatricians, our general practitioners, our internists and other specialists—renew their contact with the rest of the health team and rededicate themselves to this minimum health standard . . . throughout our population."

Walter C. Bornemeier, in his inaugural address as the AMA's 125th President, cited five areas for improvement in medical education and training: shortening the medical school curriculum; modernizing and shortening residency programs; relating more medical training to patient care at an earlier point; assimilating full-time teachers into patient care; and reducing the number of medical research institutions and researchers.

"In any new graduate program, we might be advised to emphasize again a preceptorship method of training," he said. "If MD graduates could be trained in the active practice of medicine outside the hospital with a physician or group approved for teaching, the doctor shortage would in large measure be solved." He pointed out that such training would emphasize what makes people sick as well as how to make them well again.

Those changes would allow the physician to undertake more rapidly the responsibility "commensurate with his skills and knowledge" and might "overnight add 50,000 doctors to the care of patients in our communities."

Dr. Bornemeier praised medical schools for moving in the right direction. He advocated a goal of six years from high school to the MD degree and added that in some schools, first-year students can go directly into a patient-oriented curriculum because "the conventional freshman year in medicine is being given as the final year" of pre-med schooling.

The President said there are now some 35,000 MD's in residencies who, 25 years ago, would already have been in active practice. Another 5,000 physicians have quit practice to assume positions as medical educators in hospital residency training programs. And another 10,000 to 12,000 MD's are full-time educators in medical schools, a function that 25 years ago "was done by those of us in practice."

The House heard other brief speeches from the President of the National Medical Association; the Chairman of the AMPAC Board; and the President of SAMA.

House Actions

From June 21 through June 25, the House was in business sessions for 17 hours and 15 minutes, during which it considered a record 201 items of business. Included were 61 reports and 140 resolutions—8 un-numbered memorial or commendatory ones; 27 special ones generated by the (Himler) Committee on Planning and Development; and 105 from regular sources.

Abortion

After a long debate before the reference committee and on the floor of the House, delegates adopted the following statement on abortion:

WHEREAS, Abortion, like any other medical procedure, should not be performed when contrary to the best interests of the patient since good medical practice requires due consideration for the patient's welfare and not mere acquiescence to the patient's demands; and

WHEREAS, The standards of sound clinical judgment, which, together with informed patient consent should be determinative according to the merits of each individual case; therefore be it

RESOLVED, That abortion is a medical procedure and should be performed only by a duly licensed physician and surgeon in an accredited hospital acting only in conformance with standards of good medical practice, and after consultation with two other physicians chosen because of their professional competence, and within the Medical Practice Act of his State; and be it further

RESOLVED, That no physician or other professional personnel shall be compelled to perform any act which violates his good medical judgment. Neither physician, hospital, nor hospital personnel shall be required to perform any act violative of personally held moral principles. In these circumstances, good medical practice requires only that the physician or other professional personnel withdraw from the case so long as the withdrawal is consistent with good medical practice.

Consumer Forum

For the first time in its history, the House appointed a special reference committee to hold a public forum, at which individuals and representatives of groups could present their views of medical and health care. The committee heard three hours of testimony on the opening day of the convention. From its report, the House adopted the following recommendations:

That consideration be given by the Board of Trustees to the creation of a multi-ethnic advisory committee on health care problems of minority groups.

That the House of Delegates reaffirm its policy of encouraging physicians, as well as paramedical personnel, to continue to provide compassionate and sympathetic care to all patients.

That the House of Delegates reaffirm Resolution 62, Annual Convention 1969, which states in part: "It is a basic right of every citizen to have available to him adequate health care" . . . and that "the medical profession, using all means at its disposal, should endeavor to make good medical care available to each person."

That the AMA Advisory Committee on Health Care of the American People be invited to participate in reference committee hearings of this type if they are held in the future. Consideration of having such an open forum at each AMA convention was referred to the Board of Trustees.

Dues Increase

Until this convention, the amount of AMA dues was prescribed by the Board, for adoption or rejection by the House. On Tuesday, however, the House amended the By-Laws to give itself that responsibility. Chapter III, Section 1 (A) of the By-Laws now reads:

(A) How Prescribed—Annual dues for any year shall be prescribed in an amount fixed and determined by the House of Delegates. The Board of Trustees may submit recommendations to the House on the fiscal needs of the Association and the level of dues. Dues fixed by the House shall remain in effect until changed.

In response to Board Reports A and B (financial statement of the AMA, and background detail on the need for an increase), the House voted to increase annual AMA dues by $40, to $110. At the same time, the House directed that "basic and explicit information supporting the need for this dues increase, and future dues increases, be promptly disseminated by the AMA to individual members by every reasonable and available means possible; and that the aid of constituent state associations be enlisted in this effort."

The new dues will become effective with the next fiscal year, beginning December 1, 1970.

Planning and Development

One of the longest debates of the meeting involved creating a body for long-range planning and development. When the matter was settled, a standing committee of the House—the Council on Long-Range Planning and Development—had been created and the bylaws had been changed appropriately to accommodate it.

The council will have nine members. Four will be appointed by the Speaker (two from the House and two from AMA membership at large) and four will be appointed by the Board (two members of the Board and two from AMA membership at large). The ninth member will be appointed by the President of SAMA. The council is required to submit reports to the House at each regularly scheduled convention of the AMA.

The House also acted on the recommendations of the earlier Committee on Planning and Development (Himler committee). Here are those recommendations as adopted by the House, sometimes after extensive revision:

RECOMMENDATIONS

That the AMA reaffirm, as a statement of the primary purpose and responsibility of the Association and the medical profession, "the promotion of the art and science of medicine and the betterment of public health," and, as part of this purpose, apply all possible effort to make medical services of high quality available to all individuals.

That the Association has the duty to guide and assist the medical profession in the attainment of this objective.

That the American Medical Association recognize the need for multiple methods of delivering medical services, and that it encourage and participate in efforts to develop them.

That, in the interest of attracting the most highly qualified candidates to the field of medicine, it simultaneously make every effort to maintain and create incentives in medical practice. Among these incentives are a multiplicity of practice options, maximum professional independence and freedom of choice for both physicians and patients.

Health is a state of physical and mental well-being.

That the AMA expand its active role in planning and developing programs for medical care in all of its ramifications and that it encourage and assist state and county medical societies to do the same at their respective levels.

That, clearly recognizing the health of individuals has many aspects other than medical care, such as education, housing, environmental control, transportation, civil rights, and the alleviation of poverty, the American Medical Association continue to show an active, innovative and constructive interest in these non-medical components of health services.

That the AMA and the constituent and component medical societies seek the active cooperation of all physicians, both as individuals and as members of medical staffs, in medical service projects for areas in need of medical services.

That the AMA, through its Council on Health Manpower, in conjunction with county and state medical societies and other professional, education, and lay associations, continue to explore and develop expedients to overcome health manpower shortages.

That the Association, in its future declarations and activities directed toward the alleviation of shortages in health services and personnel, underscore the fact that these shortages are not due merely to an insufficient number of health professionals across-the-board, and emphasize that maldistribution of practitioners geographically, by profession, and by specialty is an equally important factor in depriving communities of an adequate supply and spectrum of health services.

That the Association publicize the reasons for the maldistribution, as outlined in this section, and stress that the voluntary correction of these deficiencies requires public cooperation and community action in addition to the measures taken by the health professions.

That an appropriate Committee of the AMA immediately begin to formulate a policy on physicians' assistants, particularly with regard to their responsibilities, limitations on their services, and supervision of their services by qualified physicians.

That the AMA reaffirm the principle that the basic responsibility for the medical care of patients lies with their physicians of record and that the responsibility cannot be legally or morally delegated.

That the AMA approve in principle certification of educational programs for physicians' assistants but oppose licensing of these individuals by any state agency.

That the Association's Law Division upon request assist the state medical societies in identifying and avoiding any legal hazards that may accompany the employment of physicians' assistants.

In seeking as its goal the highest quality and availability of patient care, the American Medical Association advocates factual investigation and objective experimentation in new methods of delivery of health care, while still maintaining faith and trust in the private practice of medicine and pride in its accomplishments.

That the Association, in appropriate public statements, emphasize the concept that differences in education, state laws, culture and income levels create problems that may necessitate different systems of delivering medical care for different population groups and different geographic areas.

Urge state medical associations to establish bureaus or departments of economic research, development and planning to study, develop and disseminate data concerning the economic aspects of medical practice.

Through the AMA's Departments of Survey Research and Economic Research, continue to assist state associations in collecting such data and to act as a clearinghouse for data so gathered.

Encourage state medical associations to designate representatives to deal energetically with third party agencies and programs, utilizing the concept of usual, customary or reasonable charges.

That the AMA reiterate its support of sound, existing mechanisms, such as public grievance and adjudication committees, and utilization and peer review committees, which state and county medical societies have found to be most appropriate and effective for the consideration of fees and the costs of medical and related care.

Endorse the principle of voluntary, life-long postgraduate study for all physicians and continue and accelerate the development of programs and incentives for such study.

That the AMA encourage and assist all state medical associations to devise programs for voluntary post-graduate study designed to maintain medical education at the optimum level with the primary objective of assisting the physician in rendering professional services to his patients. These programs of postgraduate study should be mindful of the many demands on the time of the busy physician, and his responsibilities to his patients and his practice, and should be least disruptive to the provision of medical services.

That the Association obtain information from each state medical society as to whether special requirements have been imposed on physicians who render services to patients under the provisions of tax-supported programs and obtain the specifics of what those requirements are.

That in those states where the health or welfare departments have imposed special requirements on physicians to participate in their programs, the medical society reject those requirements and that, if the need for such regulation can be demonstrated, the state medical society, education department, and health department cooperatively develop standards to be incorporated into the education law and enforced on all physicians of that state, thereby eliminating double standards for medical practice and restoring the licensing authority to the proper agency.

The AMA, on the basis of the data received from the state medical societies, (1) continue to identify the services that comprise good medical care; (2) develop guidelines that state and county medical societies may use in evaluating needs and priorities of medical services in their respective areas, and (3) ensure that these data and guidelines are widely distributed and publicized.

That the present structure of the Association be retained and that it be strengthened by improvements and modifications in its function.

That on implementation of the program for organization and reorganization, a planning council with appropriate subcommittees be formed for the purpose of processing data and formulating policy recommendations for the consideration of the Board of Trustees and the House of Delegates.

Education

In December, 1968, the House agreed that "an ultimate goal is unification of the internship and residency years into a coordinated whole." To move closer to that goal, in this meeting the House adopted the following statements:

After July 1, 1971, a new internship program shall be approved only when the application contains convincing evidence that the internship and the related residency years will be organized and conducted as a unified and coordinated whole.

After July 1, 1975, no internship program will be approved which is not integrated with residency training to form a unified program of graduate medical education.

The House also adopted or approved essentials of approved programs in continuing medical education; essentials of an accredited educational program for histologic technicians; revision of essentials of approved internships and residencies pertaining to part-time appointments; essentials for approval of examining boards in medical specialties; revision of essentials of approved residencies in child psychiatry; revision of essentials of approved internships and residencies to add statement on employment relationships of house officers; revision of essentials of approved residencies in neurological surgery; revision of essentials of approved residencies in pathology; and revision of essentials of approved residencies in internal medicine.

A permanent Section on Neurological Surgery was created in the Scientific Assembly of the AMA.

Professional Liability

The House approved a Board report stating that liability insurance protection is essential so that physicians may continue to provide needed medical care to the public. "It has been concluded," the report said, "that the best way to provide such assurance is on a collective, rather than an individual basis, under programs jointly sponsored by the American Medical Association and the respective state medical association. . . . Minimum standards for an effective sponsored insurance program are being developed" and the Professional Liability Committee of the Board "is seeking with the insurance industry a means for instituting qualified insurance programs under such joint sponsorship with state associations which elect to participate."

Nurses and Other Allies

The following AMA position statement on nursing was adopted:

> The American Medical Association recognizes the need for, and will support efforts to increase, the number of nurses; recognizes the need for, and will facilitate the expansion of, the role of the nurse in providing patient care; encourages and supports all levels of nurse education; will promote and influence the development of a hospital nursing service, similar to a medical care service, under the leadership of a chief of professional service, aimed at increased involvement in direct medical care of the patient; supports the concept of the physician-led health team; and will seek constructive collaboration with the total nursing community.

The House also resolved that "the American Medical Association undertake a thorough investigation of a method to bring allied professions into a collaborative relationship with the AMA such as the establishment of a new class of membership;" and "that consideration be given to preparing 'essentials' for those categories of the allied health personnel groups which do not have them, and that the opportunity for vertical and horizontal mobility be considered in determining these 'essentials.' "

Drugs

The House took a number of important actions in connection with drugs. Among them:

> That the AMA "encourage Committees on Pharmacies and Therapeutics in each hospital to review drug reactions and related problems and to take appropriate control measures and to initiate informational programs."

> That the AMA "seek passage of legislation for control of the manufacture and distribution of barbiturates and amphetamines."

> That the AMA "expresses the concern of the medical profession that consumer protection be assured through more adequate surveillance of proprietary drug advertisements by private organizations and more effective cooperation in enforcement of applicable regulations by responsible governmental agencies."

> That the AMA "supports dispensing by pharmacists of all medications in child-protective containers, and encourages acceptance of the containers by parents."

> And that it is contrary to the public interest to repeal or modify "anti-substitution laws and regulations in order to permit the filling of prescriptions with therapeutic agents not intended by the prescribing physician." The House declared its intention "vigorously to support the maintenance and enforcement of anti-substitution laws and regulations."

Hospitals

The House resolved that "the terms 'negative,' within normal limits, and 'normal' be approved by the JCAH as acceptable designations for use in hospital charts."

It also resolved:

> That the AMA request the JCAH to specify that a Joint Conference Committee "include, where feasible, adequate representation from community-based physicians elected by the medical staff."

> That the AMA reaffirm its position that "general practitioners should have the opportunity to practice medicine as active staff members in hospitals and should be granted privileges commensurate with their training and demonstrated abilities."

> And that the AMA suggest that "medical staffs consider revising their respective hospital medical constitutions and bylaws to differentiate clearly between medical and administrative duties."

Miscellaneous

The House supported the Board's plan to establish a wholly owned, separate subsidiary corporation to engage in publication and possibly other related activities now carried on by the AMA in order to gain various economies, lower costs and better administrative and accounting procedures.

Delegates adopted a Board proposal to undertake a "Communications Program for the 1970's," consisting of television documentaries, educational advertising, media relations and other related activities "to improve public understanding and opinion of the profession."

Approval was given to Report A of the Judicial Council, which said, among other things, that "It is not in itself unethical for a physician to own a for-profit hospital or interest therein. The use the physician makes of this ownership or interest may, however, be definitely unethical. For example, for a physician to send a patient to such a hospital or to prolong a patient's stay in the hospital for his financial benefit would be unethical."

The By-Laws were amended to permit osteopaths in military service to become service members of the AMA.

The House resolved to "support continuing efforts by the American Medical Association to inform the medical profession of the value and benefit to be realized from the implementation of adequate peer review programs" and directed the Board, the Council on Medical Service and "other appropriate sections of the AMA" to give this project "the highest priority and emphasize its urgency to all state and component medical societies."

Mindful of its obligation to protect public health, the House called on each state society "to take whatever steps are necessary to inform state legislators about the health hazards posed by the cult of chiropractic." It also encouraged medical schools "to include specific information in their curricula regarding the nature of the health hazard to individuals . . . posed by quackery in general and the unscientific cult of chiropractic in particular."

The House directed the AMA to make a detailed and comprehensive study and analysis of the methods and requirements for reporting infant mortality statistics "by those nations that are alleged to have a lower rate of infant mortality than that of the United States."

Delegates resolved that the AMA continue its efforts "to alert the American people . . . to the ever increasing health hazards of environmental pollution and to the urgent need for expanded research and effective control measures;" and that the AMA "further extend and intensify its present activities in pollution control and improvement of environmental health."

Considering the plight of prisoners of war in North Vietnam, the House recommended that, "in the best medical interests of both servicemen and their families, the World Medical Association and/or other appropriate international organizations be requested to use their influence with those countries which do not subscribe to the Geneva Convention to the effect that (a) a list of prisoners' names be furnished, (b) inspection of prisoner compounds by neutrals be carried out, and (c) medical supplies and food parcels, as well as mail, be distributed to prisoners."

Awards

Charles B. Huggins, MD, of the Pritzker School of Medicine, Chicago, was presented the Dr. Rodman E. and Thomas G. Sheen Award at the opening session of the House, along with the check for $10,000 which accompanies the award.

Special awards were presented to the stars, creator and producer of the ABC-TV program, "Marcus Welby, MD." Robert Young (who portrays Dr. Welby); James Brolin (who plays the assistant, Dr. Kiley); David Victor, creator and executive producer; and David O'Connell, producer all received plaques in front of the House. The program and the people responsible for it were cited for portraying "the human understanding and uncompromising care which physicians give to their patients."

Also honored at the opening session of the House were the AMA winners in the 21st International Science Fair, whose exhibits were on display throughout the Scientific Assembly.

The winners were Beverly Fordham, a junior at Bryan Adams High School in Dallas: "Determination of Alpha Vigilance via Electroencephalography;" and Kevin Boran, senior at Lawton's Hill School in Pottsville, Pennsylvania: "Effects of Antidiuretic Hormone on Sweating Activity and Sweat Composition."

University of Colorado Medical Center
Dr. Aldrich to succeed Dr. Conger

Robert A. Aldrich, MD, noted pediatrician and public health expert at the University of Washington School of Medicine in Seattle, has been appointed vice president for health affairs at the University of Colorado Medical Center. Dr. Aldrich, who will come to Denver September 1, will succeed Dr. John J. Conger, whose resignation as vice president was announced several months ago.

Dr. Aldrich, 52, has been on the faculty of the University of Washington Medical School for the last 14 years and he is now head of the Division of Human Ecology in the Department of Pediatrics and director of the Health Resources Study Center. He was chairman of the Department of Pediatrics from 1956 to 1963, and in 1963-64, while on leave from Washington, he directed the National Institute of Child Health and Human Development in Bethesda, Maryland.

Dr. Aldrich is a native of Evanston, Illinois, a graduate of Amherst College and of the Northwestern University Medical School, and he has also done graduate work at the University of Minnesota. He interned at Evanston Hospital and was a resident at the University of Minnesota Hospitals. He was at the Mayo Clinic for two years and he has taught at the Universities of Minnesota, Oregon and Rochester. During World War II he served as a Navy Medical Officer.

He has been vice chairman of the President's Committee on Mental Retardation since 1966 and he has been active in numerous other public health agencies at the state and national level. He has been chairman of the Governor's Advisory Health Council, a member of the American Medical Association Council on Food and Nutrition and a member of the Government of the District of Columbia Health Task Force.

Dr. Aldrich has been on the editorial board of the AMA Journal Diseases of Children, a member of the National Board of Medical Examiners pediatric committee and a member of the training committee of the developmental biology section of the National Institutes of Health.

* * * * *

University of Nevada
School of Medicine

A $50,000 grant to the School of Medical Sciences at the University of Nevado, Reno, was announced by the Nevada Tuberculosis and Health Association. The grant provides $10,000 a year for five years to aid in the establishment of a medical school in the State of Nevada.

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OBITUARIES

Colorado

John Edward Alderman, MD, of Denver, died June 24, 1970 at the age of 48.

Born in Pitcher, Oklahoma, February 26, 1922, Doctor Alderman attended the University of Colorado and received his BA in 1949. He then attended the University of Colorado School of Medicine receiving his MD in 1952. For the following year, he interned at Fitzsimons Army Hospital, after which he served two years in the United States Army in Puerto Rico. Doctor Alderman was a member of the Denver Medical Society, the Colorado Medical Society and the American Medical Association.

He is survived by his wife May; a daughter, Christine Stella Van Soest; and a son, John Harry Alderman; his mother, Mrs. Stella Alderman; and a brother, James Alderman of Phoenix, Arizona.

James Burris Perrin, MD, Colorado physician, was living in Las Vegas, New Mexico at the time of his death, June 24, 1970.

The son of the late Dr. and Mrs. George W. Perrin, he was born June 23, 1897 in Thorntown, Indiana. When the family moved to Colorado in 1902, Doctor Perrin attended the Denver Public Schools and the University of Colorado. He continued his education at the University of Edinburgh, Edinburgh, Scotland, receiving his MD in 1933. He interned at the Royal Infirmary, Edinburgh, before attending the University of California where he received his degree in Public Health in 1928.

Returning to Denver, Doctor Perrin set up in general practice from 1933-1937 at which time he became associated with the Colorado Public Health Department as director of Maternal and Child Health and as director of the Crippled Children Department.

During World War I, Doctor Perrin was a private, first class, and although not then a physician, was attached to Base Hospital Number 29 in England. During World War II, he again joined the Army and was assigned to the 5th Air Force, later being transferred to the office of the Base Surgeon. He returned to the United States as a casualty and upon recuperation, was re-assigned to the Office of the Coordinator of Inter-American Affairs, as Associate Chief of the Medical Service. He received his honorable discharge in 1946, but since his separation from the service he has remained in the reserve, retaining his war-time rank of major.

Doctor Perrin was appointed Health Officer of the City of La Crosse, Wisconsin in 1947. Since that time he has also practiced in Denver and Sterling, Colorado.

At the time of his death, Doctor Perrin was a member of the Denver Medical Society, the Colorado Medical Society, the American Medical Association and the American Public Health Association.

He is survived by his wife, Helen; and three daughters, Helen, Susanne and Luanna.

THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Abdominal Trauma: By Meyer O. Cantor. Springfield, Ill., 1970, Thomas. 212 p. Price: Review.

Bing's Local Diagnosis in Neurological Diseases: By Webb Haymaker. 15th ed. St. Louis, 1969, Mosby. 600 p. Price: $32.50.

Brain's Clinical Neurology: By Walter Russell Brain. New York, 1969, Oxford University Press. 436 p. Price: $8.50.

Brain's Diseases of the Nervous System: By Walter Russell Brain and John N. Walton. 7th ed. New York, 1969, Oxford University Press. 1062 p. Price: $19.50.

Clinical Immunology and Allergy: By Leo H. Criep. 2nd ed. New York, 1969, Grune and Stratton. 962 p. Price: Not set.

Diseases of The Nose, Throat and Ear: By John J. Ballenger. 11th ed. Phila., 1969, Lea & Febiger. 948 p. Price: $32.50.

Electron Microscopy; A Handbook for Biologists: By E. H. Mercer and M. S. Birbeck. 2nd ed. Oxford, 1966, Blackwell Scientific Publications. 102 p. Price: $2.25.

Essentials of Human Embryology: By Frank D. Allan. 2nd ed. New York, 1969, Oxford University Press. 344 p. Price $6.95.

Handbook of Poisoning: By Robert Hastings Dreisbach. 6th ed. Los Altos, California, 1969, Lange. 477 p. Price: $6.00.

Handbook of Surgery: By John Long Wilson. 4th ed. Los Altos, California, 1969, Lange. 781 p. Price: $6.00.

The Heart, Arteries and Veins: By John Willis Hurst. New York, 1970, McGraw. 1681 p. Price: $32.00.

The Ileostomy Patient; A Descriptive Study of 1,425 Persons: By Edith Lenneberg and John L. Rowbotham. Springfield, Ill., 1970, Thomas. 208 p. Price: Review.

Medical Embryology: By Jan Langman. 2nd ed. Baltimore, 1969, Williams & Wilkins. 386 p. Price: $7.50.

Neuromuscular Diseases of Infancy and Childhood: By Kenneth F. Swaiman and Francis S. Wright. Springfield, Ill., 1970, Thomas. 261 p. Price: $14.00.

Neurosurgery of Infancy and Childhood: By Donald D. Matson. 2nd ed. Springfield, Ill., 1969, Thomas. 934 p. Price: Not set.

A Primer of Immunologic Disorders: By Heinz J. Wittig and others. Springfield, Ill., 1970, Thomas. 123 p. Price: Review.

Progress In Clinical Cancer, v. 4: Edited by Irving M. Ariel. New York, 1970, Grune & Stratton. 405 p. Price: Not set.

Robert's Rules of Order—Revised: By Henry M. Robert. Chicago, 1970, Scott, Foresman. 594 p. Price: Gift.

The Role of The Surgeon in Medical School Education: Edited by Harold G. Barker. Springfield, Ill., 1970, Thomas. 155 p. Price: Review.

Surgery Annual, v. 1: Edited by Philip Cooper. New York, 1969, Appleton. 472 p. Price: $16.00.

Surgical Anatomy of The Thorax: By Stefan Kubik. Philadelphia, 1970, Saunders. 241 p. Price: Not set.

Textbook of Neuroanatomy: By H. Chandler Elliott. 2nd ed. Philadelphia, 1969, Lippincott. 571 p. Price: $14.00.

A Textbook of X-Ray Diagnosis—Pelvis and Abdomen: Edited by S. Cochrane Shanks and Peter Kerley. 4th ed. Philadelphia, 1970, Saunders. 524 p. Price: $21.00.

MEETINGS

Children's Hospital
Denver, Colorado

Teenagers (Children's Hospital, Denver)
Vail Conference on Pediatric Practice (Vail, Colorado) (Sponsored by Denver Children's Hospital)
September 17-19, 1970

5th Annual Colorado-Nebraska Obstetric and Pediatric Conference (Children's Hospital, Denver)
October 30-31, 1970

The W. Wiley Jones Memorial Lecture (Children's Hospital, Denver)
November 13, 1970

Pediatric Neurology (Children's Hospital, Denver)
December 11, 1970

For further information contact: L. Joseph Butterfield, M.D., Director, Department of Continuing Education, Children's Hospital, 1056 East 19th Avenue, Denver, Colorado 80218.

Advances in Obstetrics and Gynecology
1970 Parkview Hospital
Post-Graduate Day Symposium
Parkview Hospital, Pueblo, Colorado

October 18, 1970

For further information contact: Samuel Nelson, M.D., 129 Colorado Avenue, Pueblo, Colorado 81005.

17th Western Cardiac Conference
What's New In Cardiology
University of Colorado Medical Center
Denison Auditorium
4200 East 9th Avenue, Denver, Colorado

October 21-23, 1970

Fee: $20.00 Colorado Participants; $35.00 out-of-state Participants. For further information write: Colorado Heart Association, 1375 Delaware Street, Denver, Colorado 80204.

75th Annual Session of the
American Academy of Ophthalmology
and Otolaryngology
Las Vegas, Nevada

October 5-9, 1970

For more information write Berland/Associates, 2729 W. Lunt Ave., Chicago, Ill. 60645, Attn: Ted Berland.

The American College of
Emergency Physicians
2nd Scientific Assembly
Las Vegas, Nevada

October 18-23, 1970

Focus will be on the delivery of primary care in the hospital emergency department. For more details write: Executive Secretary, 120 West Saginaw, East Lansing, Michigan 48823.

Postgraduate Course in Laryngology
and Bronchoesophagology
University of Illinois
Chicago, Illinois

November 9-20, 1970

This course is limited to 15 physicians. Interested registrants please write directly to the Department of Otolaryngology, Abraham Lincoln School of Medicine of the College of Medicine, University of Illinois at the Medical Center, P.O. Box 6998, Chicago, Illinois 60680.

Fourteenth Annual Cardiac Symposium
of the Arizona Heart Association
Arizona Biltmore Hotel
Phoenix, Arizona

January 22-24, 1971

For information write: Arizona Heart Association, 1720 E. McDowell Road, Phoenix, Arizona 85006.

National Conference on Cancer of the Colon
and Rectum
Hotel del Coronado
San Diego, California

January 7-9, 1971

For more information write: Roald N. Grant, M.D., Vice President for Professional Education, American Cancer Society, 219 East 42nd Street, N.Y., N.Y. 10017.

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OFFICERS—1969-70—Terms of Officers and Committeemen expire at the Annual Session of the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Session.

President: John M. Wood, Englewood.

President-elect: Marvin E. Johnson, Denver.

Vice President: Carl W. Swartz, Pueblo.

Treasurer: Edward B. Liddle, Colorado Springs, 1971.

Constitutional Secretary: James A. Henderson, Denver.

Delegates to the American Medical Association: Kenneth C. Sawyer, Denver, Dec. 31, 1970; Gatewood Milligan, Englewood, Dec. 31, 1971; Robert E. McCurdy, Denver, Dec. 31, 1971.

Alternate Delegates to the American Medical Association: Ray G. Witham, Craig, Dec. 31, 1971; Marcia Curry, Denver, Dec. 31, 1971; Leo J. Nolan, Lakewood, Dec. 31, 1970.

Speaker, House of Delegates: Harlan B. Huskey, Grand Junction.

Vice Speaker, House of Delegates: Kenneth A. Kahn, Boulder.

Foundation Advocate: James P. Rigg, Sr., Grand Junction.

Historian: Richard W. Whitehead, Denver.

Historian Emeritus: Bradford Murphey, Denver.

Scientific Editor for Colorado and Chairman of the Editorial Board, Rocky Mountain Medical Journal: Douglas W. Macomber, Denver.

Assistant Scientific Editor for Colorado, Rocky Mountain Medical Journal: Carl H. McLauthlin, Denver.

Executive Secretary: Donald G. Derry, 1809 E. 18th Avenue, Denver, Office Telephone 399-1222 (303).

Montana Medical Association

OFFICERS—1969-70—Terms of officers and committeemen expire at the annual meeting in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Meeting.

President: Oscar A. Swenson, Kalispell

President-Elect: Richard L. Peterson, Hamilton

Vice President: John Pfaff, Jr., Great Falls

Secretary-Treasurer: John A. Newman, Butte

Assistant Secretary-Treasurer: Colvin H. Agnew, Billings

Delegate to the American Medical Association: Herbert T. Caraway, Billings

Alternate Delegate to the American Medical Association: Robert W. Thometz, Butte

Executive Committee: Oscar A. Swenson, Kalispell, Chairman; Colvin H. Agnew, Billings; Herbert T. Caraway, Billings; Alfred M. Fulton, Billings; Mark B. Listerud, Wolf Point; John A. Newman, Butte; Richard L. Peterson, Hamilton; John Pfaff, Jr., Great Falls; Robert W. Thometz, Butte.

Scientific Editor, Rocky Mountain Medical Journal: Warren D. Bowman, Jr., Billings

Associate Editor, Rocky Mountain Medical Journal: L. Russell Hegland, Billings

Executive Secretary: L. Russell Hegland, 1236 North 28th Street (P. O. Box 1692), Billings 59103. Office Telephone, 259-2585.

Nevada State Medical Association

OFFICERS—1969-70—Terms of officers and committeemen expire at the Annual Session in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Session.

President: V. A. Salvadorini, Reno.

President-elect: V. E. Elliott, Fallon.

Secretary-Treasurer: John P. Sande, Reno.

Delegate to A.M.A.: Leslie A. Moren, Elko.

Alternate Delegate to A.M.A.: Kenneth E. Turner, Las Vegas.

Immediate Past President: Harry J. McKinnon, Jr., Las Vegas.

Scientific Editor for Nevada Rocky Mountain Medical Journal: Harry J. McKinnon, Las Vegas.

Assistant Scientific Editor for Nevada, Rocky Mountain Medical Journal: Wesley W. Hall, Reno.

Associate Editor, Rocky Mountain Medical Journal: Nelson B. Neff, Reno.

Executive Secretary: Mr. Nelson B. Neff, 3660 Baker Lane, Reno. Telephone 323-6788.

New Mexico Medical Society

OFFICERS—1970-71—Terms of officers and committeemen expire at the Annual Session in the year indicated. Where no year is indicated the term is for one year only and expires at the 1971 Annual Session.

President: Harry D. Ellis, Santa Fe.

President-Elect: Vaun T. Floyd, Albuquerque.

Secretary-Treasurer: James R. Gay, Albuquerque.

Immediate Past President: Hugh B. Woodward, Albuquerque.

Speaker, House of Delegates: Ronald V. Dorn, Albuquerque.

Vice Speaker, House of Delegates: William J. Hossley, Deming.

Delegate to A.M.A.: Allan L. Haynes, Clovis.

Alternate Delegate to A.M.A.: Emmit M. Jennings, Roswell.

Scientific Editor for New Mexico, Rocky Mountain Medical Journal: Marcus J. Smith, Santa Fe.

Assistant Scientific Editor for New Mexico: William S. Curran, Albuquerque.

Associate Editor for New Mexico: Mr. Ralph R. Marshall, Albuquerque.

Executive Secretary: Mr. Ralph R. Marshall, 3010 Monte Vista Blvd., NE, Albuquerque; Telephone 265-8494, area code 505.

Assistant Executive Secretary: Mr. Thomas A. Bodnar, Albuquerque.

Utah State Medical Association

OFFICERS—1969-70—Terms of officers and committeemen expire at the Annual Session in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Session.

President: John H. Rupper, Provo.

President-elect: Russell M. Nelson, Salt Lake City.

Secretary: Allan H. Barker, Salt Lake City.

Treasurer: Ralph C. Richards, Salt Lake City.

Past President: Homer E. Smith, Salt Lake City.

Delegate to A.M.A.: Drew M. Petersen, Ogden.

Alternate Delegate to A.M.A.: Merrill C. Daines, Logan.

Speaker, House of Delegates: William R. Christensen, Salt Lake City.

Vice Speaker, House of Delegates: Wm. Knox Fitzpatrick, Salt Lake City.

Scientific Editor for Utah, Rocky Mountain Medical Journal: Alan E. Lindsay, Salt Lake City.

Associate Editor, Rocky Mountain Medical Journal: Mr. Hoyt W. Brewster, Salt Lake City.

Executive Secretary: Mr. Hoyt W. Brewster, 42 South Fifth East St., Salt Lake City. Telephone EL. 5-7477.

Wyoming State Medical Society

OFFICERS—1969-70—Terms of officers and committeemen expire at the Annual Session in the year indicated. Where no year is indicated the term is for one year only and expires at the 1970 Annual Session.

President: John J. Corbett, Casper.

President-elect: Fenworth M. Downing, Sheridan.

Vice President: William G. Erickson, Lander.

Secretary: Duane M. Kline, Cheyenne.

Treasurer: Donald F. Mahnke, Casper.

Delegate to AMA: Harlan B. Anderson, Casper.

Alternate Delegate to AMA: Thomas A. Nicholas, Buffalo.

Speaker of the House: Goode R. Cheatham, Jr., Casper.

Vice Speaker of the House: Norman R. Black, Cheyenne.

Scientific Editor for Wyoming, Rocky Mountain Medical Journal: Francis A. Barrett, Cheyenne.

Associate Editor for Wyoming, Rocky Mountain Medical Journal: Mr. Robert Smith, Cheyenne.

Executive Secretary: Mr. Robert Smith, P. O. Box 1387, Cheyenne, Wyoming 82001.

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Rocky Mountain Medical Journal

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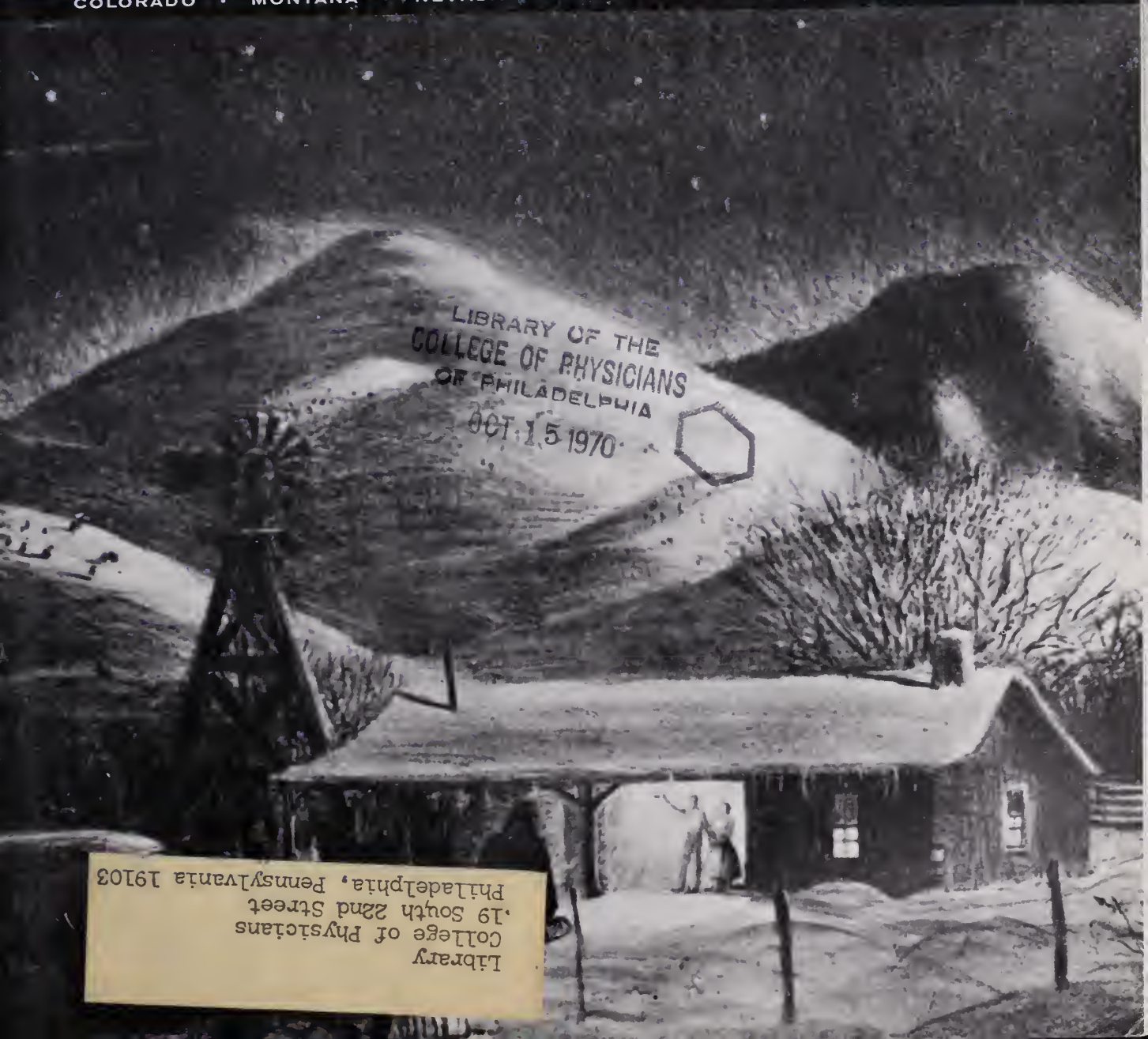

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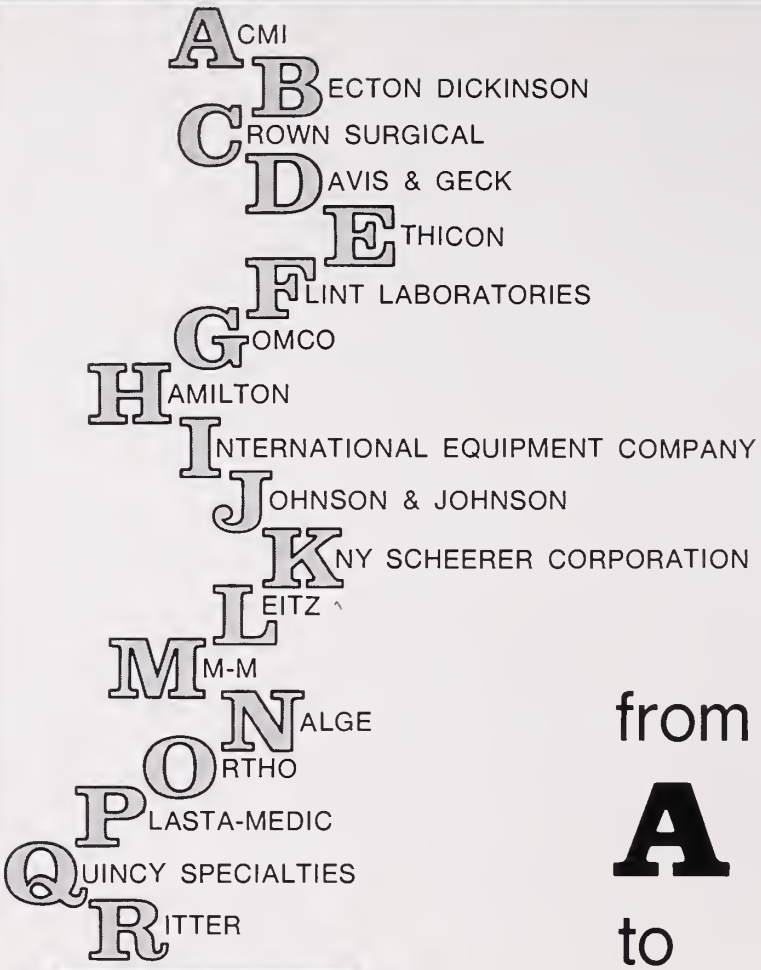

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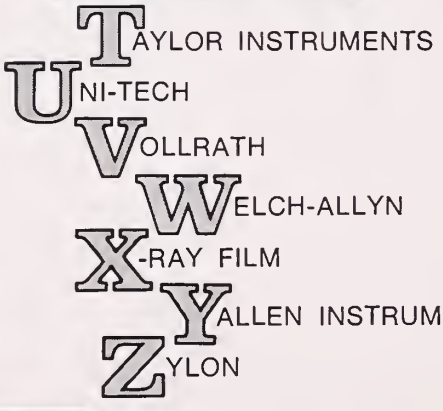

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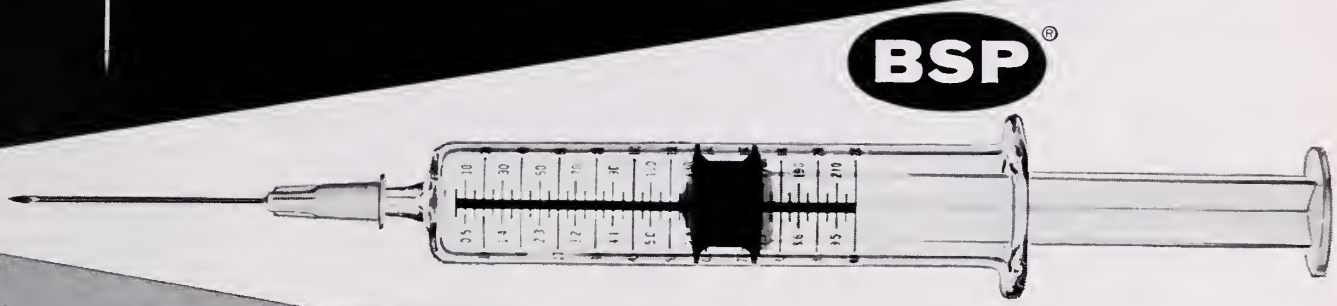

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OUR COVER PHOTO

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The photograph is by Drucilla Denney.

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67th ANNUAL MEETING

NEVADA STATE MEDICAL ASSOCIATION

Sahara Tahoe Hotel - - Stateline, Lake Tahoe, Nevada

October 21 - 24, 1970

Tuesday, October 20

7:00 P.M. **Executive Committee meeting**

Wednesday, October 21

8:00 a.m. **Golf Tournament**

1:30 p.m. **NSMA House of Delegates**

Thursday Morning, October 22

8:30 a.m. **Welcome**—President V. A. Salvadorini, M.D.

SESSION A

8:45 a.m. **Diagnostic Evaluation of Patients with Angina Pectoris**
ROBERT ZELIS, M.D., Assistant Professor of Medicine; Chief, Laboratory of Clinical Physiology, University of California, Davis School of Medicine, Davis, California

9:15 a.m. **Radiographic Diagnosis of Angina**
MELVIN P. JUDKINS, M.D., Professor and Chairman, Department of Radiology, Loma Linda University, Loma Linda, California

9:45 a.m. **Drug Therapy of Angina**
DEAN T. MASON, M.D., Professor of Medicine; Chief, Cardiopulmonary Section, University of California, Davis School of Medicine, Davis, California

10:15 a.m. **View Exhibits**

10:45 a.m. **Diuretic Rationale**
DEAN T. MASON, M.D.

11:15 a.m. **Renal Hypertension**
RALPH A. STRAFFON, M.D., Department of Urology, Cleveland Clinic, Cleveland, Ohio

11:45 a.m. **Luncheon**

SESSION B

8:45 a.m. **Crushed Chest Syndrome**
HERBERT O. SIEKER, M.D., Professor of Medicine, Duke University Medical Center, Durham, North Carolina

9:15 a.m. **Extremity Trauma**
WILLIAM MURRAY, M.D., Associate Professor of Orthopedics, University of California, San Francisco, California

9:45 a.m. **Management of Burns**
VICTOR RICHARDS, M.D., Clinical Professor of Surgery, University of California; Chief of Surgery, Children's Hospital of San Francisco, California

10:15 a.m. **View Exhibits**

10:45 a.m. **Diagnosis of Hypovalemic Shock**
JAMES B. D. MARK, M.D., Professor of Surgery, Stanford University Medical Center, Palo Alto, California

11:15 a.m. **Treatment of Hypovalemic Shock**
JAMES B. D. MARK, M.D.

11:45 a.m. **Luncheon**

1:30 p.m. **Radiological Evaluation of Coronary Artery Surgery**
MELVIN P. JUDKINS, M.D.

2:15 p.m. **Drug Abuse - A Disease of Medical Progress**
SANFORD J. FEINGLASS, Ph.D., Director of the Center for Drug Information, Research and Education, California State College, Hayward, California; and Research Associate, Institute for Study of Human Problems, Stanford University, Palo Alto, California

3:00 p.m. **View Exhibits**

3:30 p.m. **Beer and Pretzels - Round Table Discussions**

7:00 p.m. **Wine Tasting** - Wiebel Winery, San Jose, California

Friday, October 23

7:00 a.m. NEMPAC Breakfast

SESSION A

8:45 a.m. **The Dyslipoprotenemios**
ROBERT ZELIS, M.D.

9:15 a.m. **Mosquerade of Lupus**
HERBERT O. SIEKER, M.D.

9:45 a.m. **Learning Disabilities: With Speciol Reference to Behovior Problems**
LEON V. WHITSELL, M.D., Assistant Clinical Professor of Pediatrics, University of California Medical Center, San Francisco, California

10:15 a.m. **View Exhibits**

10:45 a.m. **Autoimmune Diseases**
HERBERT O. SIEKER, M.D.

11:15 a.m. **Selection of the Rheumatoid Potient for Synovectomy**
WILLIAM MURRAY, M.D.

11:45 a.m. **Luncheon**

SESSION B

8:45 a.m. **Rodiological Tool for Diognosis of Renal Inflammatory Disease**
MELVIN P. JUDKINS, M.D.

9:15 o.m. **Monagement and Diagnosis of Urinory Infections of Children**
RALPH A. STRAFFON, M.D.

9:45 o.m. **Diognosis ond Antimicrobiol Monogement of Adult Urinory Troct Infection**
CLAIR COX, M.D., Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, North Carolina

10:15 a.m. **View Exhibits**

10:45 o.m. **The Associotion of Urologic ond Gynecologic Diseose**
CLAIR COX, M.D.

11:15 o.m. **The Sterile Couple**
RAFAEL DURFEE, M.D., Department of Obstetrics and Gynecology, University of Oregon Medical School, Portland, Oregon

11:45 o.m. **Luncheon**

1:30 p.m. **Fluid and Electrolyte Problems**
VICTOR RICHARDS, M.D.

2:00 p.m. **The Pill**
RAFAEL DURFEE, M.D.

2:30 p.m. **Drug Abuse - Re-Involving the Physicion**
SANFORD J. FEINGLASS, Ph.D.

3:00 p.m. **View Exhibits**

3:30 p.m. **Beer and Pretzels and Round Table Discussions**

7:30 p.m. **Bonquet** honoring Wesley W. Hall, M.D., President-elect, American Medical Association
Speaker: Walter Von Tilburg Clark, Poet, University of Nevada, Reno

Saturday, October 24

7:00 o.m. **Post Presidents' Breokfost**

9:00 o.m. **NSMA House of Delegotes**

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October 22-23

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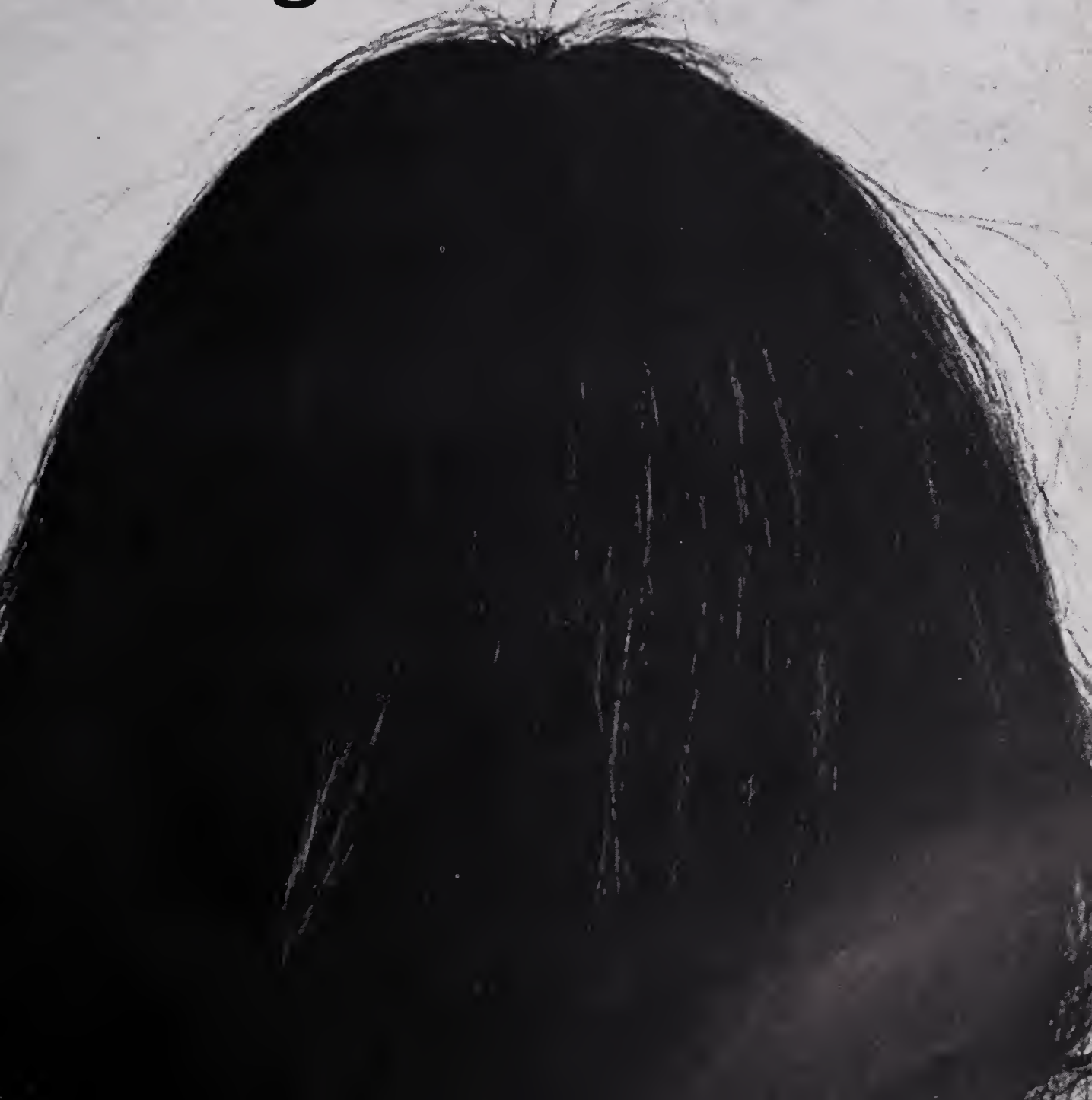

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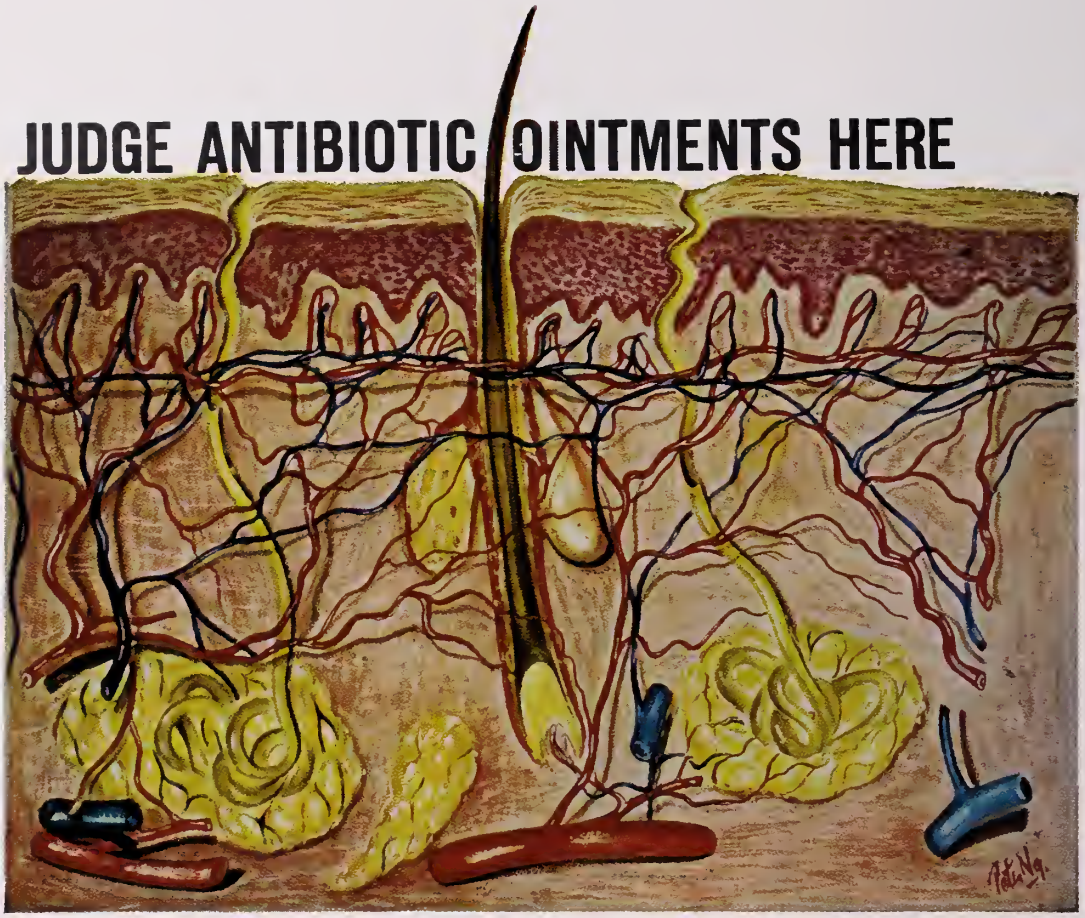

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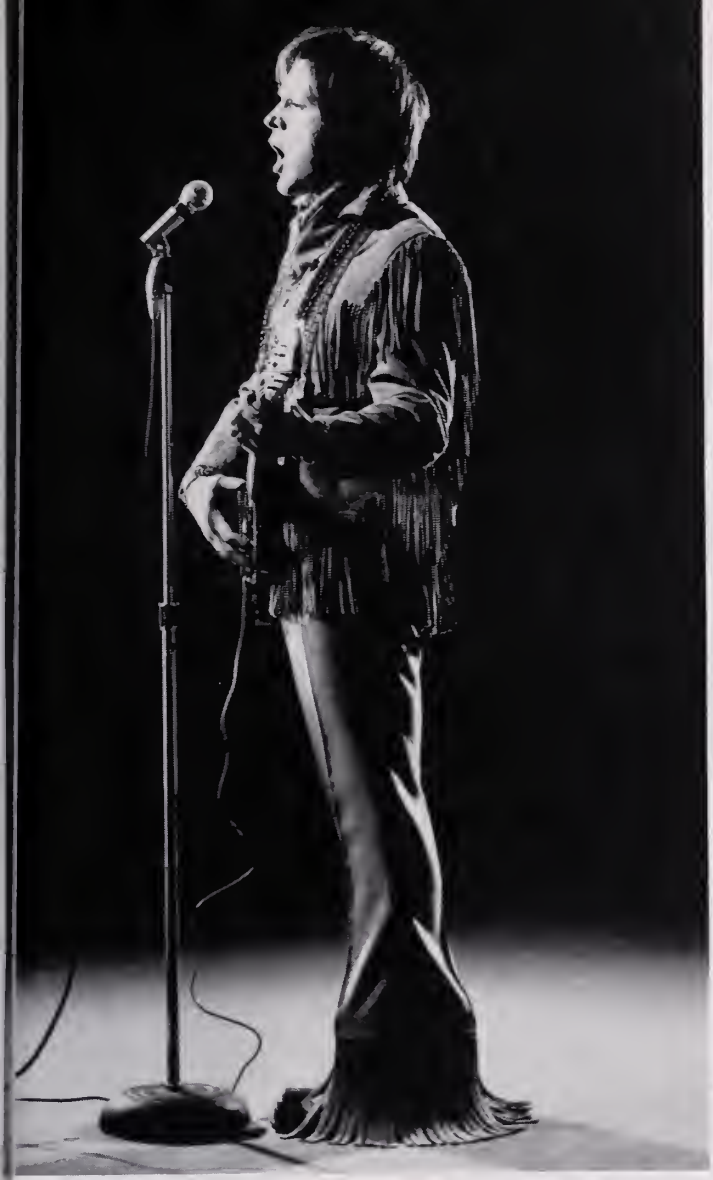

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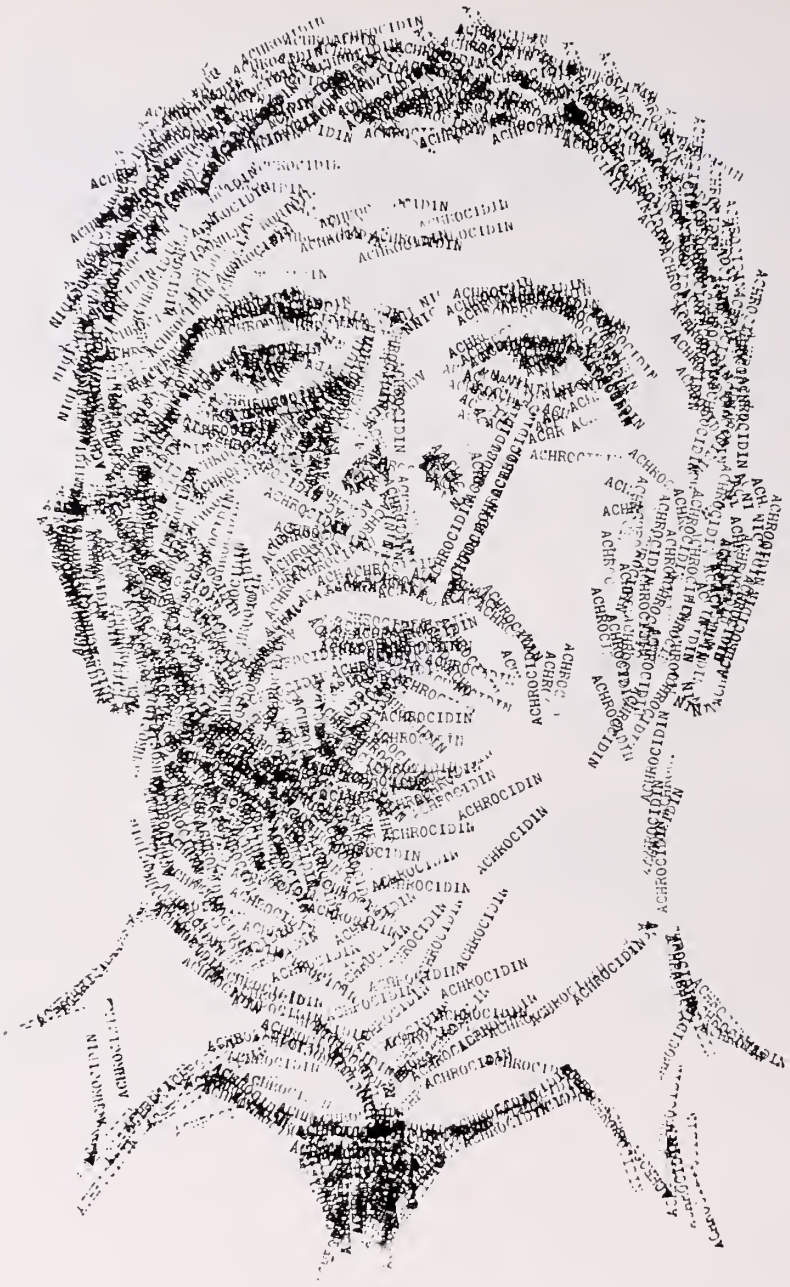

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The Gila Monster Bite

THE EFFECTS OF Gila Monster bite, described elsewhere in this issue, will be of special interest to physicians in the desert areas of the Rocky Mountain States. Fortunately, none of us is likely to encounter H. suspectum cope outside of a zoo, (let alone his Mexican cousin H. horridum Weigmann)—which is just as well. The colorful description of the big lizard, hissing and drooling, is one which makes us content to view him from a safe distance.

Several aspects of this unusual paper deserve more serious emphasis. The detailed description of how the Gila Monster produces its venom and employs its uniquely grooved teeth indicates that Dr. Stahnke's personal experiences and extensive studies have made him a leading authority on the subject. If any patients or physicians should be bitten by the Gila Monster, it is surely of practical value to know that the lizard's teeth are easily broken off. The animal should be seized and immediately wrenched free from its victim. Trying to wedge its teeth apart, as illustrated in the case description, is a slow and inefficient method which greatly increases the release of venom. Other effects of a bite, including the vasospasm not previously described, are useful additions to our knowledge.

Finally, we cannot help calling the readers' attention to the apparent merits of Scotch whiskey, the old snakebite preventive, in prolonging the lives of rats to which venom had been administered. Unfortunately human studies to substantiate these findings are not likely to appear.

William S. Curran, MD
Asst. Scientific Editor
for New Mexico

The Late Call

PETER HURD, one of America's distinguished (and embattled) artists, is a New Mexican, and probably lives not too far from the ranch house and mountain which occupy the center of his black and white lithograph, *The Late Call*, reproduced on our front cover this month.

Perhaps the central character of the lithograph, the doctor, is a member of the Chaves County Medical Society—but we cannot be sure: his face is hidden. However, we can be sure that he is devoted to his patient's well-being; this is evident as he turns up his collar against the bitter cold and steps out of his inexpensive car. Striding vigorously through the clear, fresh snow, he restores hope to the anxious parents who wait with their beckoning lantern. Above, the bright stars add their friendly illumination to a dark, disease-filled world.

We can assume that the patient is a young girl who lies (unseen) in her room, sobbing with pain. She hears the doctor enter the house, talk quietly with her parents. Soon he will look into her throat and ears with his piercing, all-knowing eyes, touch her tummy with his sensitive, discerning hands and talk her into swallowing some awful, red, raspberry-flavored medicine, and then she will be better.

As a child, I remember seeing a similar picture, probably painted in the nineties. It showed a pale, feverish young girl with glazed blue eyes and lifeless golden hair, lying feebly in her bed. Sitting next to her was her gray-haired doctor, one hand on her wrist, the other holding his pocket watch, his kindhearted eyes clouded with concern, his bearing one of timeless dedication.

The old doctor lived at a time when house calls were an accepted method of delivery of

medical care. In the forties, the number of house calls began to diminish. The reason for this was not the doctor shortage which resulted from World War II, but the realization by the doctor that he could no longer cope with a serious emergency in the patient's bedroom. The doctor of 1890 could manage just as well in a patient's home as in his own office or hospital. But a half a century later the boil-the-water and remove-the-appendix-on-the-kitchen-table school of medicine was obsolete.

The information explosion made this impossible. The patient's chances of a correct diagnosis and proper treatment in his comfortable bedroom were considerably less than in the uncomfortable, sterile environment of the modern hospital where the tools of diagnosis were assembled, the opportunities existed for consultation and the myriad drugs and solutions were present that could not possibly fit into the doctor's bag.

Other factors contributed: The increase in malpractice suits. The terror in the big cities—doctor's lured on spurious house calls, only to be robbed and beaten. The development of a new specialty—emergency room medicine and of intensive care units staffed by carefully trained nurses and technicians.

Tomorrow's painting by tomorrow's artist will show the late call in the year 2,000. The sick child is delivered by jet-ambulance to the hospital Emergency Care Unit where she is instantly connected to a battery of probing electrodes, transducers, monitors, remote control intensifiers, a 500-channel analyzer, satellite telemetry and closed-circuit television. Adjacent to her solid-state litter is a clacking programmer feeding information to computers, one of which automatically notifies organ banks in five different parts of the world.

There is no kindly doctor in (contaminating) street clothes to reassure the child She sees only masked, green-clad, robot-like figures—physicians, nurses, technologists, electronic repairmen and data processors. Undoubtedly she is frightened, but her chances of recovery from her acute illness or injury will be much greater than they were in 1970 or 1890.

In the meantime, we have our problems. We find that the emergency rooms of today are being abused by doctors who use them for convenience, and by patients who do not need immediate attention. As soon as we have figured out the solution to this problem, we will let you know. .

Marcus J. Smith, MD

ERRATUM

THE ACID BASE SURFACE

by N. Balfour Slonim, M.D. and N. Karen Estridge, Denver

Pages numbered 60 and 61 have been printed in reverse order.

Page numbered in Journal as "61", beginning "tolerance . . .", should have been numbered "60".

Page numbered in Journal as "60", beginning "Although . . .", should have been numbered "61".

Pages 62 and 63 are correct as printed.

Our sincere apology to the authors of this splendid article for the unfortunate error.

Pages 59-63, August 1970, Rocky Mountain Medical Journal.

Bite of the Gila monster

H. L. Stahnke, PhD,* W. A. Heffron, MD† and
D. L. Lewis,† MD, Albuquerque, N. M.

A description of the usual clinical course of Gila Monster bite is presented, with suggestions about first aid and definitive management. Data regarding the venom and its reactions with various drugs and with alcohol are presented.

THERE IS A PAUCITY of detailed clinical information regarding Gila monster bite (venenation). Such injuries occur under circumstances that make gathering of detailed data difficult or impossible. Therefore, it seems desirable to record a case that occurred under circumstances permitting the gathering of considerable data, and also to report a previously unreported death resulting from the bite of a Gila monster. In addition to this, certain events that occurred during the incident and a review of the literature indicate that important facts regarding the Gila monster are apparently not common knowledge.

CASE REPORT

M. W. a 27-year-old male, University of New Mexico biology student, was bitten on the distal phalanx of his right index finger by a Gila monster, (**Heloderma suspectum** Cope), which he was showing to a group of students. The animal was 45 cm. long and weighed approximately 2,000 gms. The animal had been handled regularly, including the day before; however, it had been kept in a cloth sack the night previously. Another student had tried to remove the Gila monster from the sack and failed when the animal was highly irritated and bit the sack several times, salivating sufficiently to wet several areas of the sack. Insofar as could be determined it was in good health and had been fed the day previously. It had been in captivity for eight months. The ambient temperature in the room at the time of the incident was estimated to be upper 80° F.

The lizard's jaws were locked in place for an estimated 3 to 5 minutes before they could be pried loose (one observer estimated 6 minutes). This was accomplished by pushing the pointed end of a chair back between the jaws, proximal to the finger. During this exercise, the animal's teeth produced mild multiple lacerations. There was one small puncture laceration of the nail. The student immediately felt dizzy and then experienced waves of nausea and throbbing pain in the affected finger, the right arm, and epigastrium. He was not syncopal, was aware of activities about him, and had no respiratory distress, although, he did feel moderately nervous and excited. Cryotherapy was used until he arrived at the hospital. Forty minutes after the injury he was seen in the Emergency Room and given 30 mg. of Codeine, 5 mg. Tensilon and 25 mg. Phenergan without visible effect. He was admitted to the Medical Service.

Physical examination upon admission to the Medical Intensive Care Unit revealed a well-developed, alert, cooperative white male who was moderately anxious, but not sweating. He was tachypneic with shallow respirations at 24/min. He was complaining of moderately intense pain in his right index finger, the entire right arm, the right side of his chest, and epigastrium which he described as throbbing. His blood pressure was 90/60 and his pulse was 90 and regular. Just proximal to the nail, his right index finger had an

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irregular annular laceration with a dusky appearing edge on the distal phalanx just proximal to the nail. The entire finger had a blanched white appearance and was cold to touch, after having been out of ice for 30 minutes. The right arm had a diffuse hyperemic appearance. No adenopathy was noted and he had a good radial pulse in the right arm. No purpuric or ecchymotic areas were noted. His chest was clear with good ventilation and heart sounds and size were normal. Abdominal exam revealed diffuse mid-epigastric tenderness; bowel sounds were normal and no masses were noted. Neurological examination revealed no tremors or paresthesias—sensory modalities were intact except the patient complained of poor sensation in the affected finger. Motor function was normal except he would not use the right arm due to pain. Cranial nerves, cerebellar system and deep tendon reflexes were normal. The remainder of his physical examination was normal.

Inquiry into his past history revealed that he had consumed two cans of beer the night before admission, and that he had been treated six years previously because of a sidewinder rattlesnake bite, with no apparent sequelae.

Pertinent laboratory studies included a slightly elevated white count, white red cell morphology, platelets, complete tests of clotting, serum bilirubin SGOT and LDH were normal. Urinalysis on admission showed hyaline and granular casts; a day later there was still a positive hematest reaction. Bilirubin, haptoglobin and urine hemosiderin determinations were all normal, as were all coagulation studies.

After admission, he was given 200 mg. Lidocaine into the right brachial artery in an attempt to relieve pain and reduce the arteriospasm. Within about 3 minutes, the color returned to the proximal two phalanges. This procedure was followed in one hour by an I.V. regional infusion of Xylocaine using 40 ml. of ½ per cent Xylocaine I.V. in dorsum of hand with tourniquet inflated to 300 mmHg. One hour after the release of the tourniquet, the entire finger turned pink and remained so during the rest of his hospitalization. For the remainder of his hospitalization, he had normal vital signs, no respiratory distress, no neurological involvement and no evidence of hemolysis. He was treated with one axillary nerve block using 15 cc. of 1 per cent Xylocaine to relieve pain and with 1.2 million units Penicillin intramuscularly q 8 hours.

At the time of discharge, there was no evidence of infection or loss of motor function. The wound had healed well. The only deficit was an area of hypoesthesia just proximal to the site of the dorsum of the involved finger, 1.0 cm. in diameter. Subjectively, the patient felt this area was returning to normal. Seventy-two hours after admission, the student was discharged to resume his biology studies. In follow-up exam one week later the superficial epidermis had desquamated and he had an uneventful recovery.

Clinical Comments

In our patient the most dangerous complication was severe arteriospasm in the affected digit. The arteriospasm was so great it was initially feared that he might loose the finger. However, within two hours after the use of regional perfusion Xylocaine anesthesia the finger looked viable. This particular complication and its treatment was not found described in the literature. His other complaints of dizziness, nausea, throbbing pain, and anxiety with tachypnea all appeared as a part of the clinical response seen by other authors.

Grant and Henderson[3] reviewed 24 cases from the literature and found seven deaths which may or may not have been due to Gila monster bite. The remainder of their other findings included various symptoms and signs: localized edema, severe pain, cyanosis around the wound, faintness and dizziness, diaphoresis, nausea, vomiting, profuse bleeding (one case), dyspnea and slight paralysis, shock, "increased heart action," chills and fever, pallor, red streaks on arm, "lumps on the tongue," bulging eyes," slight dysphonia, seeing blinding lights and numbness.

Biology of the Gila Monster

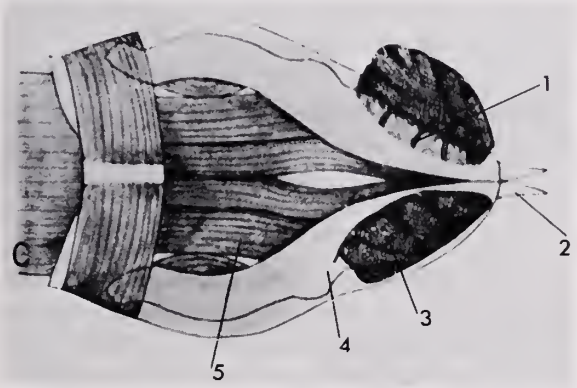
Only two species of lizard are definitely known to produce venom: *Heloderma suspectum* Cope, the Gila monster, with its center of distribution in central Arizona, and *H. horridum Weigmann*, the Mexican beaded lizard, also known as Escupion (the spitter), Escorpion or El Scorpion (apparently corruptions of Escupion) and Lizard of Death (Indians).

These are large, heavy-bodied lizards. The trunk and tail are stout and rounded and the limbs are relatively short. The dorsal scales are vaulted (hence, the "beaded" lizard) over bony tubercles. The ventral scales are quadrangular and flat. The distal portion of the tongue is smooth, slender, deeply forked and retractile; the basal part is fleshy and vellose.

The Gila monster has about 20 grooved, slightly curved, pleurodont teeth weakly attached to the inner surface of each jaw (Fig. 1). Each tooth is rather sub-triangular in

Fig. 1. A. Gila monster upper jaw, left half, showing pleurodont condition and longitudinal grove of teeth.

B. Gila monster lower jaw, right half, inner aspect showing pleurodant condition and longitudinal grove of teeth.



C. Venom gland: (1) Venom duct; (2) Forked tongue; (3) Venom gland; (4) Lower jaw; (5) Muscle.

cross-section. Venom is produced by modified submaxillary glands. Each gland lies under the anterior half of the lower jaw, with the anterior end touching the symphysis and the posterior end reaching the lip commissure (Fig. 1c). The glands consist of 3-5 lobes and each lobe has its own excretory duct which opens separately to the base of the teeth through the labial tissue. The venom collects in the labial pocket.

Venom can be transferred by each tooth. The excited lizard drools profusely and slowly opens and closes its mouth in a threatening way, sometimes making a sort of hissing sound by forceful exhalation (hence, the "spitter"). During the opening and closing action the upper teeth are bathed in the labial pool of venom of the lower jaw. Thus the surface and the grooves are loaded with venom, and when the lizard bites, both upper and lower teeth can transfer venom. When it bites, the Gila monster retains a firm hold and while so doing often produces a slight side to side motion of its lower jaw. The grooves are of such nature that a capillary duct can be formed with the victim's tissue. Thus the longer the lizard can hold on the more venom can be transferred by capillary action in addition to that transferred by the teeth surfaces. A highly irritated Gila monster will attempt to turn over, ventral side up, while still holding on to the victim. This action can be nicely demonstrated by inducing the excited animal to grab a broad leather belt. If the animal is further irritated it will flip over on its back but continue to hold on to the belt. Such a behavioral response could facilitate the flow of venom, from a copious supply, into the wound produced by the sub-triangular teeth. The exposing of its ventral surface could not be interpreted as a protective behavior since this surface is most vulnerable.

Gila Monster Venom

Gila monster teeth puncture wounds bleed very freely. Previously the venom was thought to be an anticoagulant. Careful tests have not supported this concept (Lee,[4] 1968). Our studies indicated no anti-coagulant activity and also no evidence of hemolysis. This free-bleeding seems to be more likely due to the type of puncture produced by the sub-triangular teeth; somewhat after the principle behind the old triangular bayonet.

Compared to the venoms of the Crotalidae (rattlesnakes), *H. suspectum* venom is very low in enzymatic activities. Only the spreading factor is in relatively high concentrations

(almost twice that of *Crotalus terrificus*) (Styblová[10] and Kornalik, 1967). Tu[11] and Murdock (1967) report that Gila monster venom hydrolyzed TAME (p-toluene sulfonyl-L-arginine methylester) and BAEE (N-benzoyl-L-arginine ethyl ester) but did not cause hemorrhage on envenvomation. The injection of venom into laboratory animals, likewise, does not produce local edema. However, clinically both severe local edema and, occasionally, ecchymosis have been experienced. Via the intraperitoneal route *Heloderma suspectum* venom is about as lethal as that of the Western diamondback rattlesnake, *Crotalus atrox* Baird & Girard.

The rat LD_{50} of the lizard venom is 10.3 mg/kg body weight; that of the rattlesnake is 10.6 mg/kg; mouse LD_{50} is 3.0 mg/kg (Stahnke,[9] 1966). Mebs & Maudonal[6] state "The LD_{50} for Heloderma suspectum was 0.82 μg/g mouse, for Heloderma horridum 1.4 μg/g mouse, s.c. injection. The toxic factor is heat stable; heating the venom at pH7.2, 100°C for 15 minutes, no loss of toxicity was observed. A comparative estimation of cobra venom toxicity (Naja naja) resulted in a LD_{50} of 0.8 μg/g mouse, thus in effect the toxicity of Heloderma venom is comparable with that of cobra venom,"—"it contains a very active hyaluronidase, a phospholipase A and a kinin-releasing enzyme with small proteolytic activity and a pH-optimum of 8.5 Electrophoretically both venoms are similar." The great potential toxicity, verified by these workers, emphasizes the importance of rapid detachment of the animal. Only through holding on to the victim can a lethal dose be delivered. Tu, et al (1967) report a mouse LD_{50}, via subcutaneous route, of 2.0 μg/g body weight while Styblova, et al. (1967) report an MLD of 0.4 mg/kg I.V. and 4.0 mg/kg S.C.

Fawcett[2] (1949), working with guinea pigs and using a dose of 2 MLD's, reported an average respiratory failure time, in 17 animals, of 1 hour 57 minutes. Respiratory failure occurred on the average of 50.3 minutes before heart failure. He reported an increase in RBC and a decrease in WBC. Average lymphocytes before venom injection were 65.6 per cent, after venom 42 per cent; neutrophiles before 26.3 per cent, after 36.2 per cent. Average hemoglobin increased from 15.19 grams to 19.4 grams. Patterson[7] (1967) reported a rat LD_{50} of 1.35 $\pm$ 0.53 and 1.34 $\pm$ 0.70 mg/kg via the intracardiac route.

In the above paper, Patterson states that in rats general symptoms appear within 25 mins. after injection of venom were—in order of decreasing severity—cyanosis accompanied by dyspnea or apnea, convulsions, protrusion of eyes, poor muscular coordination, lacrimation, and restlessness. In both dogs and rats the venom caused an immediate reduction in blood pressure and changes in intrathoracic and post-caval pressures. Ventilatory irregularities found—such as gasping, rapid shallow breathing, or apnea—were accompanied by a reduction in arterial blood oxygenation.

Postmortem examination of both rats and mice that have succumbed from Gila monster venom show severe periorbital hemorrhage. Mice, receiving very small sublethal doses of venom, develop white, opaque corneas (Stahnke, unpublished data).

According to the vital statistics of the Arizona Department of Public Health only one death occurred from Gilt monster bite during the period from 1929—1969 (Stahnke, 1966 and unpublished data). The available information on this case is as follows.[12,13] The patient, T.M.R. 60 years old, white male, had been a resident of Casa Grande, Arizona for one year; originally from Pennsylvania; pool hall proprietor; date of death April 28, 1930, at 12:30 p.m., cause of death "poison, Gila monster bite"; duration 2 hours. No hospital record data is available for this patient but persons who were present have reported that he was allegedly under the influence of alcohol and as part of his treatment he received morphine.

This incident prompted one of us (H. L. S.) to investigate the effect of alcoholic beverages and narcotics on the toxicity (LD_{50}) of Gila monster venom. The rat subcutaneous LD_{50} of the venom was 16.8 mg/kg of body weight. Ten mg/kg of codeine phosphate reduced the venom LD_{50} to 14 mg/kg; 50 mg/kg of meperidine (Demerol*) lowered the LD_{50} to 13.1 mg/kg; 50 mg/kg of morphine sulphate reduced the LD_{50} to 10 mg/kg. Reciprocal tests indicated that ½ LD_{50} of

*Venom from several animals is pooled and then aliquoted precisely in lyophilized vials sealed *in vacuo*. The LD_{50} varies from lot to lot.

venom would also increase the toxicity (lower the LD_{50}) of the narcotics: Codeine from 238 to 200; Meperidine 190 to 107; Morphine 226 to 168 (Stahnke, unpublished data).

The tests of the effect of alcoholic beverages on the activity of the venom produced some surprises. The rat subcutaneous LD_{50} of the Gila monster venom used in these tests was 14.0 (±5.8) mg/kg.[4] The effects of ethanol and various beverages administered by stomach tube to rats immediately after S.C. injection of the venom are shown in the following table:

Substance	*% alcohol*	*Dosage (ml)*	*LD_{50} mg/kg*	*Lethal time (hrs.)*
Venom only	—	—	14.0 (±5.8)	6
+ethanol	40	5.0	14.0 (±7.0)	30
		20.0	15.0 (±7.4)	12
+scotch	43	5.0	20.0 (±8.2)	48
		20.0	14.0 (±7.0)	48
+vodka	43	5.0	16.8 (±8.3)	12
		20.0	14.0 (±7.0)	24
+tequila	43	5.0	16.8 (±7.0)	12
		20.0	16.8 (±7.0)	12
+brandy	30	5.0	16.8 (±8.3)	9
		20.0	20.0 (±8.3)	36

The above data indicate that neither 40 per cent ethanol nor the alcoholic beverages increased the venom toxicity and all the test animals receiving the ethanol or beverages lived longer than those receiving venom alone. However, in those rats receiving the alcoholic fluids, proteolysis increased considerably. Lesions were common rather than exceptional. Even though the venom was injected S.C. in the groin, some rats exhibited marked inflammation of the tail and hind feet. Several rats experienced anal bleeding and about 25 per cent of the animals developed cyanosis in their tails. Three chewed their tails to the point of damaging or shortening them. (Dengler, 1967)

One other fatality apparently due to a venomous bite should be mentioned. Shannon[8] (1954) reported this death as due to rattlesnake bite. The victim, a two-year-old child of cottonpickers, was left to entertain itself while the family picked cotton near Goodyear, Arizona. A younger brother was sent to check on the child's welfare only to find it bleeding profusely from the face and in a semi-comatose condition. One of us (H.L.S.), present at the autopsy, made two convincing observations; a series of small punctures in an arc on the chin of the child and severe periorbital hemorrhage. At the site of the accident the thick silty soil showed more disturbance than that produced by a snake. It appears as though the infant picked up the "visitor" and pulled the lizard up to its face to show it some affection.

First Aid Suggestions

As with any type of venenation, time is an extremely important factor. In the case of Gila monster bite this is especially so. There are many teeth to transfer venom and a significant amount of venom can be transferred in seconds. However, the longer the lizard holds on, the more venom is transferred. Since the spreading factor is so abundant, the greater time lapse before treatment is started the more venom is absorbed.

How can the Gila monster be dislodged once it has grabbed its victim? The early settlers of Arizona and the older cowboys had many unique suggestions. Most of these are included in the following list of suggestions by Lowe[5] and Limbacher (1961): "The jaws are frequently opened only with considerable difficulty if mechanical means (eg. pliers) are employed. Pouring alcohol (rubbing, ethyl, whiskey, etc.), chloroform, or gasoline into a Gila monster's mouth is an effective way to cause the lizard to loosen its grip. This may also be accompanied by the application of the flame from a match or cigarette lighter to the under surface of the lizard's jaw or neck." The early cowboys added one more idea, i.e. poke straws into the lizards nostrils. By the time most of these items could be made available the lizard would have transferred a large dose of venom. Furthermore, a lizard with its mouth clamped on a finger doesn't leave much room for pouring liquids. Then, too, a person alone on the desert with a Gila monster clamped to some part of his anatomy would find it extremely difficult to use any of these suggestions.

One of the authors (H. L. S.) has been bitten at two different times by Gila monsters. The first time a highly irritated, drooling, 18-inch specimen clamped his jaw across the second phalanx of the middle finger of the left hand. The second bite was just back of the nail on the left index finger. In both cases a firm grasp of the tail of the animal and a

hard pull removed it in a matter of seconds. The first lizard lost eight teeth; the second four. The Gila monster teeth are pleurodont and are relatively weakly anchored. When extracting venom great care must be taken when propping open the lizard's mouth because the teeth dislodge very readily and the venom is then contaminated with blood.

For both bites hypothermia was employed. In the first instance the bite, because of its short duration, was not taken seriously. There was profuse bleeding and in about 15 minutes the pain was very severe and nausea was experienced. Since ice was not available, freon was used. The nearest ice was a distance of 10 miles over mountain roads. The freon supply was exhausted approximately 10 minutes before ice was obtained. During this period the distal half of the hand developed a 2+ swelling. After ice was available, the entire hand and part of the forearm was placed in ice and water. The patient was kept perspiring lightly, drank much water and kept the member in the iced-water for about eight hours. After cryotherapy* was instituted the edema advanced only up to the wrist. Twenty-four hours after the bite only slight edema and tenderness to touch persisted. No further untoward effects were experienced. The second bite produced only a few painful lacerations. The hand was immediately (within five minutes) placed in iced water and kept there for two hours. There was no edema and the wounds healed rapidly.

*Hypothermia and cryotherapy must not be confused. See Stahnke 1966.

Using subcutaneous and intramuscular thermistors it has been shown (Stahnke, unpublished data) in rabbits that by means of a freon spray, within ten minutes, the temperature (without freezing the tissue) can be reduced S.C. to 48°F. and IM. to 52°F.

Discussion

All bites of the Gila monster are not equally toxic. Sometimes a lizard will bite without showing signs of irritation. Under these circumstances very little venom is present. However, a highly irritated animal will drool venom. Such bites can transfer considerable venom in a few seconds and could deliver a lethal dose in minutes.

Local injections of Xylocaine Hydrochloride (Lidocaine Hydrochloride) will relieve the intense pain often accompanying a bite and does not increase the toxicity of the venom; in fact, just the opposite seems to be true.

The principle of chemical compatilibility should always be kept in mind when selecting therapeutic agents. The Gila monster venom is a complex mixture containing at least 15 protein fractions and made up of about 62 per cent protein. (Stahnke, 1966) If the selected therapeutic agents have not been previously laboratory tested in conjunction with the venom, they should be administered with caution.

The Poisonous Animal Research Laboratory keeps on hand a small supply of Heloderma suspectum antivenin consisting of lyophilized rabbit serum. •

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[13] This is apparently Bogert & Del Campo's (1956) case #18 which was taken from an old newspaper clipping.

Treatment of rattlesnake bites

Indications for Surgery

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Experience with 23 patients is basis for national physiologic approach emphasizing early surgical decompression when indicated.

SNAKES HAVE BEEN WITH man for all of recorded history. Indications are that from the beginning they have been a problem. There is an aura of mysticism about snakes that has caused most societies to fear and worship the serpent. Perhaps it is a residual of this mysticism that produces such divergence of thought and confusion regarding the management of snake bites. My interest in this subject was developed by observing a number of patients coming to the University of New Mexico Affiliated Hospitals following rattlesnake bites with complications that seemed preventable.

It is my intention to emphasize those aspects of the treatment of rattlesnake bites in which I feel surgery may be beneficial in prevention of loss of tissue and function. Mortality does not seem to be of major concern in snakebite management. There was only one death from snakebite reported in New Mexico between 1950 and 1959.[4]

It is helpful to separate treatment of snakebite into three phases which are determined by pathologic causes occurring at various times and are of practical importance because of treatment indicated during each phase.

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Phase I: 0 to 12 hours (phase of systemic reaction, time when first aid measures and medical treatment are indicated).

Phase II: 12 to 48 hours (phase of local reaction, period of time when vascular impairment may become evident and decompressive surgery may be beneficial).

Phase III: Beyond 48 hours (phase of resolution, reconstructive procedures indicated at this time).

TABLE 1
SEVERITY OF ENVENENATION

CLASS 0:	No Envenenation—Tooth Marks Only
CLASS I:	Minimal Envenenation — Tooth Marks, 1-5 Inches of Erythema
CLASS II:	Moderate Envenenation — Severe Local Reaction, Moderate Systemic Reaction
CLASS III:	Severe Envenenation—Severe Local and Systemic Involvement

One of the valuable contributions to snakebite care is classification of severity of envenenation advocated by Wood, et al,[7] as noted in Table 1. This classification is of great benefit in determining the results of treatment. It is, however, a retrospective evaluation and of little value in determining treatment early after snakebite. There are certain considerations which make it possible to render intelligent guesses about the severity of the snakebite. There is a correlation between the size of the snake and the dose of venom.[6] Snakebites inflicted earlier in the season seem to be more potent. On the other hand, snakes which have recently been disturbed and discharged their venom are less potent, and if the snake manages to penetrate with only one fang it is probable that the dosage is less. One must err on the side of

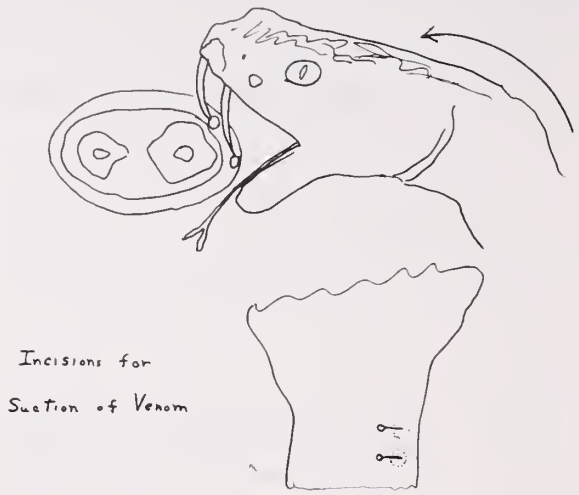

Fig 1

TABLE 2
PHASE I (0—12 HOURS)
FIRST AID MEASURES

1. Minimal Activity (Sedation If Available)
2. Limb Splinted and Not Elevated
3. Tourniquet (*Lymphatic* Only)
4. Incision and Suction (Only During First Hour)
5. Cooling (Not Freezing)

TABLE 3
PHASE I (Continued)
MEDICAL MEASURES

1. Antivenin
2. Steroids
3. Antibiotics
4. Anitetanus
5. General Supportive Measures (Intravenous Fluids, Blood, Oxygen, etc.)

over-treatment when evaluating a snakebite victim during the first hour or two since there is no certain way of knowing the severity. The local pain and swelling which result from snakebite occur within the first few hours. Two hours or more after the bite, if there is little or no local reaction, it is safe to assume one is dealing with a grade 0 or I snakebite and treatment can be limited accordingly.

Treatment

First aid measures immediately after injury are outlined in Table 2. Most of these considerations are self-explanatory. It is better not to mention tourniquet at all since this device is usually mismanaged. If used, it should be loosely applied and moved proximally as swelling advances. Opportunity for performing incision and suction rarely comes to the physician and is seldom performed with any benefit by the lay first-aider. If done properly as indicated in Figure 1, and done within the first hour, there is good theoretical and experimental evidence of benefit. Because of the character of the striking mechanism of the rattlesnake, the venom pockets are always superficial and, therefore, incisions should not extend beneath the fascia. The incision should be extended from the point of puncture for about three-quarters of an inch toward the direction from which the snake struck. The small pocket of venom is sought for and removed.

Perhaps the area of greatest controversy is that of cryotherapy.[1,3] There is definite benefit in the use of cooling during the initial phase in order to delay resorption of toxins and diminish the severity of local reaction. This is not a form of treatment—it merely is a delaying mechanism to permit transportation to a medical center and cooling should not be prolonged beyond the time when the patient comes under medical observation. Emphasis should be placed on cooling with unsalted ice with protection of the limb from direct contact.

Table 3 outlines treatment which can be initiated once the patient reaches medical care. Any doubt which may have existed regarding the efficacy of antivenin can be dispelled.[5] It is very important to initiate this medication as soon as possible. Skin testing is important to protect the patient from reaction to horse serum. People sensitive to horse serum can still be given antivenin after desensitization and with the protection of hydrocortisone. Antivenin should be given intravenously. Giving it locally in the area of the snakebite is without good foundation and this practice inflicts additional trauma on an already damaged extremity.[2] The dose given is inversely proportional to the size of the patient and directly proportional to the estimated size of the dose of venom.

Steroids probably have no direct effect on activity of the venom. However, in the individual who obviously has received a serious

envenenation, it is wise to use steroids for general support of the circulatory system. Antibiotics should be used routinely because of the necrotizing type of injury produced and because the venom of the rattlesnake has been shown to contain both gram negative and gram positive pathogens.[1] Among these are the Clostridium organisms, and, therefore, antitetanus immunization is of prime importance. Support of the general circulatory status is extremely important as massive extravasation of fluid may produce a hypovolemic state. Isotonic solutions, colloid and blood should be used as indicated.

By the end of the first twelve-hour phase of treatment, most of the above measures have been accomplished and the tendency is to lapse into a period of watching and waiting. During the second period the local reaction becomes most severe and embarrassment to the peripheral circulation from local swelling can produce loss of tissue. Careful attention should be paid to the five P's of vascular insufficiency. (Table 4). Most important among these is the beginning of an ascending, stocking-type hypesthesia related to the devascularization of the peripheral nerve fibers. When this stage has been reached, thorough surgical decompression is the next obvious step. Decompression should include both skin and fascia, should extend as far proximally as the swelling has progressed and, when necessary, should include exploraration and decompression of specific peripheral arteries. The only considerations which should deter one from proceeding with this emergency surgery is the moribund state of the patient from the systemic effect of the toxin or evidence of failure of the clotting mechanism through the effect of venom on hemo-coagulation. Once adequate decompression of a compromised extremity has been accomplished, there is no way of closing the wounds. They should be left open for several days until swelling has subsided and then secondary closure performed where possible and skin grafting when closure is not possible.

The third phase of management exists after the phase of acute swelling with vascular compromise. Management here usually consists of physical therapy, splinting and,

TABLE 4

PHASE II (12—48 HOURS)

Period of Edema and Vascular Impairment

Vascular Status Must Be Watched Carefully

1. Pain
2. Paresthesias
3. Pallor
4. Pulselessness
5. Passive Motion Pain

where there has been loss of tissue, reconstructive surgery. Procedures indicated may include debridement and skin grafting, amputation, and muscle sequestrectomy in patients who have developed areas of devitalized muscle within compartments. These contracting elements will produce compression of the contained peripheral nerves and contracture of effected joints. It is important to remove devitalized muscle before it can produce any later and more permanent changes.

Experience

The experience at the Bernalillo County Medical Center includes 23 patients seen in the three years between 1966 and 1969. The age distribution of the 23 patients seen was between three and 67 years; half were five years old or less. Twelve received their entire treatment at the Bernalillo County Medical Center while the other eleven were seen only during phase three. Of the twelve patients receiving their entire treatment at the BCMC, three were class 0, three were class I, five in class II, and one qualified as a class III envenenation. There were, therefore, only six patients in whom there was threat to life and limb. Of the eleven patients seen only during the late stages (Phase III), three came to BK amputation, one to an AE amputation, one to a BE amputation and there were three major compartment muscle losses. Thus eight of eleven had serious complications. Of the six class II and III patients treated at the BCMC according to the system outlined, there was no loss of tissue. Morbidity included a septic arthritis and a mild scar contracture in two different patients. All had clear cut evidence of vascular impairment at the time their decompressive procedure was performed, and all had prompt return of circulation following the operative procedure.

Summary

A unified rationale of treatment has been presented for management of rattlesnake bites depending upon the time since injury and seriousness of the snakebite. A plea has been made for recognition of the frequently occurring evidences of peripheral vascular insufficiency in those with more serious snakebites. Results in six patients treated early by surgical decompression are presented. There were no serious complications in this group as opposed to an 80 per cent complication rate in people seen too late to correct the vascular lesion.

Attention is also called to the importance of removing the necrotic muscle in order to prevent the late complications of joint contracture and nerve entrapment. •

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Progressive supranuclear palsy in a Navajo

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The first report in a Navajo of a "recently recognized" neurological disorder. The implication of slow virus is suggested.

Steele, Richardson and Olszewski (1964) described five patients with paralysis of vertical gaze, pseudobulbar palsy, dysarthria, dystonic rigidity of neck and trunk muscles, and other less constant cerebellar and pyramidal symptoms. They named the syndrome progressive supranuclear palsy. The clinical features of this disorder are strikingly constant despite the widespread involvement of the brainstem and basal ganglia at autopsy; but hitherto such patients have been thought to suffer from Parkinson's syndrome. After the original description, a number of other cases have been reported but all of these have been in white or Negro patients.[1,2] This is the first reported case of progressive supranuclear palsy in a full-blooded Navajo Indian.

CASE REPORT

The patient is a Navajo "sing" man who had been in good health until 1968 when he began to fall to the right intermittently. Physical examination at that time was said to have been normal. An electroencephalogram was mildly abnormal with dysrhythmic bursts over the right frontotemporal areas. Cerebrospinal fluid, routine blood and urine analysis were all normal.

In March 1970 he presented again because of progressive confusion, auditory hallucinations, inappropriate laughter, staring into space for long periods of time, and inability to perform ceremonial "sings" because of forgetfulness. The falling episodes continued and he developed periods of shaking of his left arm and leg.

On examination he could communicate only through his wife who did speak English, but he understood her questions and commands. His blood pressure was 125/90; pulse rate 76 and regular; and the general physical examination was normal. There was an expressionless face with wide open and staring eyes, which rarely moved from the neutral position (Fig. 1). He could not look up or down on command and had some difficulty with lateral gaze. Following an object with his eyes was similarly defective. The eyes moved, however, freely in response to vestibular stimuli such as on passive motion of the head either from side to side or up and down. The rest of the cranial nerves were intact. His neck was short and movements of the neck were extremely difficult in all directions both on command and when attempts were made to passively move his neck. There was marked rigidity of the left arm and leg and myoclonic jerks of the left foot were seen. His gait was slow with small shuffling steps. There was marked bradykinesia and loss of associated movements on walking. His left foot was externally rotated on walking. Deep tendon reflexes were brisk bilaterally and there was patellar and ankle clonus on both sides. The left plantar response was extensor and the right flexor. Palmo-mental reflexes were present. Sensation and cerebellar function were normal in upper and lower limbs.

LABORATORY INVESTIGATIONS: Complete blood count, blood urea nitrogen, creatinine, and urine analysis were all normal. The fasting blood sugar was 105 mg.%; a 2-hour postprandial blood sugar was 100 mg.%. The cerebrospinal fluid showed a normal pressure, 3 lymphocytes/mm,^{3}, glucose of 66 mg.%, protein 30 mg. %, negative VDRL and negative culture for bacteria. X-rays of the skull, brain scan and electroencephalogram were normal. A pneumoencephalogram showed generalized ventricular dilatation with considerable cortical atrophy (Figs. 2 and 3).

Electronystagmography showed absent optokinetic nystagmus in all directions of movement

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of the drum. Positional testing produced nystagmus to the right when the head was tilted back and to the right. This disappeared on assumption of the sitting position. Nystagmus to the right was again induced by tilting the head back and to the left. When rolled to the left side nystagmus to the right was seen.

Comments

The patient complained of repeated falling attacks. This symptom is probably explicible on his inability to look down and the rigidity of his axial musculature.[1,2] The supranuclear ophthalmoplegia found clinically in our patient was confirmed by electronystagmography which, in addition, showed evoked nystagmus with positional changes of the head and body compatible with a central rather than a peripheral lesion. The ventricular dilatation seen on pneumoencephalography is consistent with the widespread pathologic lesions previously described.[1] These involved the striatum, tectal and pretectal nuclei and are characterized by striking neuronal loss and gliosis in these areas, accompanied by profuse neurofibrillary changes and granulo-vacuolar degeneration.

Although the distribution of the lesions is different, the pathologic changes of supranuclear palsy bear a remarkable resemblance to those described in the amyotrophic lateral sclerosis and Parkinsonism dementia complex commonly found in Chamorros on Guam.[3] It has been suggested that the disease in Chamorros might be due to an infectious agent. Histopathologically it resembles postencephalitic Parkinsonism. In both conditions apart from the loss of neurons, neurofibrillary tangles are prominent like in progressive supranuclear palsy. The presence of amyotrophic lateral sclerosis and Parkinsonism dementia complex in a particular population group has also raised the possibility of it being genetically determined; however,

Fig. 1. Patient's face to show evoked and spontaneous position of eyes. Top row from left to right: head tilted back showing downward movement of eyes; looking straight ahead, the patient's usual appearance; head tilted forward showing upward movement of eyes. Bottom row, from left to right: head twisted to left showing movement of eyes to right; patient attempts to look to the right on command; head twisted to the right showing movement of eyes to the left.

Fig. 2. Pneumoencephalogram showing widely dilated cerebral ventricles.

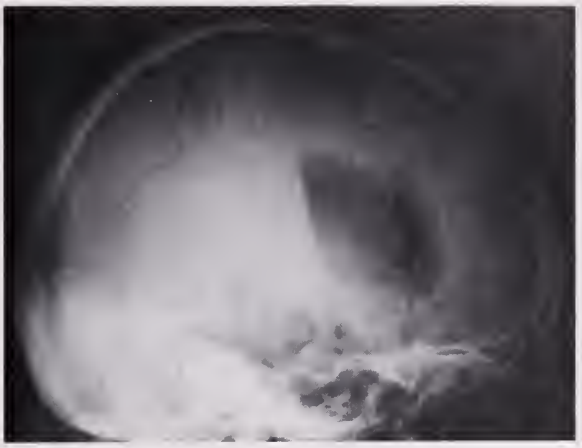

Fig. 3. Lateral view, brow up, showing in addition to ventricular dilatation a large amount of air, particularly over the frontal and temporal areas.

Kuru, a widespread disease of the nervous system originally considered a genetically determined degenerative disorder has now been shown to be transmissible to monkeys by brain inoculation of tissue from affected patients, the symptoms requiring some months or years to develop in the inoculated animals.[4,5] More recently Jakob-Creutzfeld disease, another so-called degenerative condition, has been shown to be transmissible to animals by inoculation of brain tissue from patients with the disease, the symptoms requiring some months to appear also.[6] Because of the similarities in the histopathological appearance of these diseases and progressive supranuclear palsy, it might be possible to transmit the latter to animals if appropriate material should become available. This first report of the disorder occurring in a Navajo Indian supports the suggestion that supranuclear palsy is probably not genetically determined and that this disease might be related to an ever-enlarging group of so-called degenerative disorders of the nervous system which are now suspected to be caused by "slow viruses."

Summary

A case of progressive supranuclear palsy in a Navajo Indian is reported. The clinical features were similar to those previously reported in other cases with this disease. The gaze palsies were confirmed by electronystagmography and air encephalography showed dilatation of the cerebral ventricles and cortical atrophy. This first report of the disorder in a full-blooded Navajo Indian suggests that the disease is not genetically determined and consistent with the view that it might be the result of an infection with a so-called "slow virus." •

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Iatrogenic devitalization of wound tissues

George B. Markle IV, MD, Carlsbad, New Mexico

A pocket-size packet of wisdom pointing up common breaches of good surgical technic.

AN UNEXPLAINED paradox in surgery is the observation that the most painstaking and the best trained surgeons may have a much higher incidence or wound infection than average. Usually the answer has been sought in bacteriologic studies, and many a surgeon has been distressed to learn that his nasopharynx has been harboring pathogenic organisms. Unfortunately in many cases, his incidence of wound infections tends to persist in spite of all attempts to eradicate this putative source.

Others have re-examined their surgical technics, revising and extending surgical preps, and going to greater lengths than ever in following Halsted's principles. While Halsted's goals of meticulous hemostasis are good, I feel that too much preoccupation with them may become self-defeating; too much dead or devitalized tissue and too much foreign material is left in the wound—just what Halsted was trying to avoid.

This comes about by several means. First, it is obvious that the more little vessels that are tied, the more gut, silk, or whatever, is implanted in the wound; and no matter how careful the surgeon, each tie leaves a bit of devitalized tissue behind.

Second, the overly meticulous surgeon takes too much time, exposing wound surfaces to airborne bacteria and to the drying effects of the air.

Third, by cutting a bit, stopping to make many ties, then cutting more, the plane of the incision is interrupted, resulting in a new plane being started, leaving an ischemic or dead ridge of tissue, usually fat, along the side of the incision (see diagram). This is especially likely when one tries to cut while his assistant is enthusiastically applying hemostats. A whole series of serrations made on both sides of the wound may be overlooked because they appear to fall together or are covered by wound towels or packs. This may be one of the reasons why infections are most common in the adipose layer.

Wounds should be made accurately and quickly, cutting down to the fascia with as few strokes of the scalpel as possible. When a second or third stroke is necessary, as in an obese patient, care should be taken to separate the wound with some tension bilaterally so that subsequent strokes of the blade

Fig. 1. Schematic drawing illustrating: A. How distortion of wound by hemostats may cause creation of ridges of devitalized tissue; B. Arrows point to resulting necrotic areas.

begin at the exact end of the one before, thus eliminating the jogs and ridges of devitalized tissue created by uncertain and interrupted progress. Only larger vessels should be tied at this point, as the smaller vessels are held compressed by the lateral tension mentioned. Hemostasis is then secured before entering the abdomen or other area to be explored, and it will be found that many of the tiny vessels that some surgeons tie routinely are now no longer bleeding. A normal bleeding time is three minutes or less; we have used this time to good purpose rather than in tying off vessels; the natural hemostatic mechanisms will willingly take care of much bleeding without artifical trauma and introduction of foreign material. Then, too, the time saved in opening can be better spent in careful exploration, making sound decisions, and in performing the more intricate parts of the operation. •

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Cutaneous metastasis confined to the scrotum*

Report of Two Cases

Stanley Weitzner, MD, Albuquerque, N. M.

METASTATIC CARCINOMA is infrequently encountered in the skin of the scrotum. Three cases[1-3] were noted in the American Urological literature of the three past decades. One patient with renal carcinoma developed several cutaneous metastases, one of which was scrotal.[1] In another patient with renal carcinoma, the scrotum was the only site of skin metastasis.[2] The third had widely disseminated prostatic carcinoma with numerous cutaneous metastases including several on the scrotum.[3] It is of interest that the scrotum was not a site of cutaneous metastasis mentioned in two large studies of men with internal carcinoma.[4,5] In addition, metastatic carcinoma in the skin of the scrotum is not cited in any of the standard textbooks of Urology or Pathology.

Two patients in whom the scrotum was the only site of cutaneous metastasis are presented.

CASE REPORTS

CASE 1: A 70-year-old white man was admitted on July 28, 1965, because of frequent episodes of coughing and wheezing of four months' duration. In 1963, the patient underwent resection of an atherosclerotic abdominal aortic aneursym. The remarkable findings on physical examination were increase of the antero-posterior diameter of the thorax, an occasional expiratory wheeze over the mesial left upper lung field, well-healed lower abdominal scars and a 1.0 cm. firm, subepidermal nodule in the right lateral scrotum. Routine clinical laboratory data were within normal limits. A chest roentgenogram disclosed a small irregular density in the left upper lobe. Review of the chest roentgenograms obtained two years earlier disclosed no pulmonary infiltrate.

The clinical impression was possible carcinoma of the lung, pulmonary emphysema and a calcified epidermal inclusion cyst of the scrotum. Bronchoscopy, performed on the second hospital day, did not reveal any neoplasm. The bronchial aspirates were inadequate for evaluation. Cytologic examination of several sputum specimens were interpreted as suspicious for malignant cells. A scalene node biopsy did not reveal a tumor. The right scrotal nodule was then excised.

The specimen consisted of an ovoid portion of skin measuring 2.4 x 1.8 x 1.0 cm. in greatest dimensions. There was a centrally located firm subepidermal nodule, which on cut surface was circumscribed, gray-white, and measured 1.0 cm. in diameter. Microscopically, the nodule consisted of irregular cords, islands and sheets of malignant squamous cells. The neoplastic cells were often joined by intercellular bridges; there was a rare abortive pearl (Fig. 1). The overlying epidermis was intact and separated from the tumor by a narrow band of normal dermis.

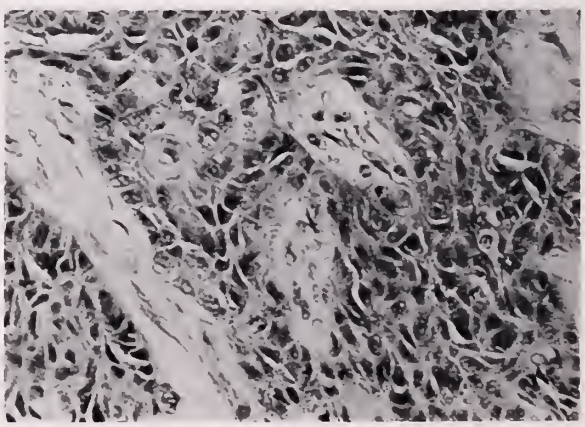

Fig. 1. Microscopic appearance of cutaneous tumor of Case 1.

*From the Department of Pathology, Veterans Administration Hospital, and University of New Mexico, School of Medicine, Albuquerque, New Mexico.

Diagnosis: Metastatic squamous cell carcinoma, skin of scrotum.

The patient was considered inoperable. He received 4,000r to the left upper lobe tumor and did well for a short period of time but then developed several episodes of pneumonia, deteriorated gradually and died in January, 1966.

Postmortem examination disclosed squamous cell carcinoma of the upper lobe of the left lung, metastatic carcinoma in the right kidney, bronchopneumonia with organization, left empyema and pulmonary emphysema. There were no other skin metastases.

CASE 2: A 36-year-old white man was admitted on November 8, 1956, for terminal care. Laparotomy several weeks earlier at another hospital disclosed widespread intra-abdominal metastatic tumor. The histopathologic diagnosis was undifferentiated malignant tumor. There was no history of any pigmented or other skin lesion having been excised. Physical examination on admission to the V. A. Hospital disclosed bilaterial moist rales, a moderately protuberant abdomen, and ascites. No intra-abdominal masses were palpated. The routine clinical laboratory data were within normal limits except for a hemoglobin of 12.0 gm. and a sedimentation rate of 33 mm. per hour. A chest roentgenogram revealed irregular densities compatible with metastatic tumor in the right lung. Intravenous fluids were instituted after several days because of increasing nausea and vomiting after any oral intake. The patient had intermittent generalized convulsions, developed pneumonia and expired one month after admission.

Autopsy disclosed metastatic malignant melanoma in the heart, lungs, spleen, liver, peritoneum, omentum, cerebrum, and skin of the scrotum. No primary melanoma was found.

The firm nodule on the postero-inferior portion of the scrotum measured 3.0 x 2.0 x 1.0 cm. in greatest dimension and was covered by intact epidermis. The cut surface was gray. Microscopic examination disclosed irregular islands and cords of polygonal and round cells with pleomorphic and hyperchromatic nuclei. Many nuclei contained a prominent nucleolus. The cytoplasm was pale eosinophilic; some cells contained melanin pigment (Fig. 2). The tumor nodule was separated from the epidermis by a band of normal dermis. There was no junctional change in the epidermis.

Comment

Cutaneous metastases in two series of men with internal carcinoma were found in 0.7 per cent[4] and 1.4 per cent[5] of the cases. The site of the primary neoplasm in both studies combined was the lung in 41.6 per cent, the gastrointestinal and genitourinary tracts in 26.7 per cent each and the upper respiratory tract in 5.0 per cent. Thirty-one per cent of

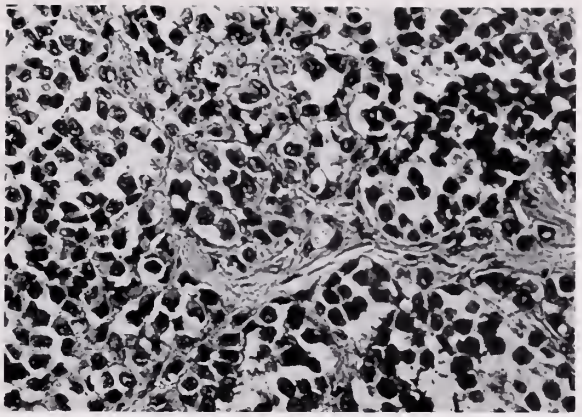

Fig. 2. Photomicrograph of cutaneous lesion of Case 2.

one group of patients with malignant melanoma developed skin metastases.[6] Cutaneous metastases are usually multiple and occur most often on the thorax and abdomen.[4,6]

The two cases reported are unusual in that the cutaneous metastasis in each was solitary and on the scrotum. The presence of a well-defined band of normal dermis between each lesion and the overlying uninvolved epidermis confirmed their metastatic nature. In addition, in the patient with disseminated malignant melanoma, the possibility of the scrotal lesion being the primary tumor is further excluded by the absence of any junctional changes in the overlying epidermis.[7] That the primary lesion in this patient, as in many cases of disseminated melanoma, was not detected, may be explained by spontaneous regression of the primary melanoma as noted by Smith and Stehlin.[8]

Cutaneous metastases have no distinctive clinical features[4-6,9] and their true nature is often realized only after pathologic examination. This is well-exemplified in Case 1, in which the scrotal nodule was considered to be a calcified epidermal cyst, but following its excision, the malignant nature of the pulmonary infiltrate was confirmed. Skin involvement may develop from a malignant neoplasm by direct extension or by lymphatic or hematogenous dissemination. In these two cases, the hematogenous pathway is the most likely basis for the scrotal metastases. The selectivity of the scrotum as the sole site of a cutaneous metastasis cannot be explained and is probably best regarded as another of

the many vagaries of malignant neoplasms. Skin metastases are indicative of dissemination of the tumor and early fatal termination.[9] In one of the series of internal carcinoma in men, the period of survival after the appearance of the cutaneous metastasis ranged from a few weeks to 18 months with a mean of three months.[5]

Metastatic involvement of the scrotal skin is probably not as rare as indicated by the paucity of cases in the literature. The extremely low incidence may possibly be explained by inadequate examination of the scrotal skin at autopsy, and considering those encountered clinically as most likely being a benign lesion. Perhaps scrutiny and excision of scrotal skin nodules, especially in the middle and older age groups, may yield a higher incidence of metastatic lesions.

Summary

Two patients with metastatic involvement of the skin confined to the scrotum are reported. In one, the excision of the scrotal skin nodule disclosed metastatic squamous cell carcinoma and confirmed the malignant nature of a pulmonary density which could not be elicited by the usual clinical investigative measures. The metastatic malignant melanoma nodule in the second case was discovered at autopsy. Hematogenous dissemination was the most likely pathway in both. The absence of any distinctive clinical features of the cutaneous metastasis and the short term survival after its appearance are noted. Scrutiny and excision of scrotal skin nodules, especially in the middle and older age groups, may yield a higher incidence of metastatic lesions and the valuable information they may provide. •

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Pericardial effusion

A comparative diagnostic study

David B. Goldenberg, Major, MC, Byron G. Brogdon, MD, and Henry N. Wagner, Jr., MD, Albuquerque, New Mexico*

This study was undertaken to compare the relative accuracy of three technics and to formulate an overall diagnostic approach.

RADIOGRAPHIC TECHNICS are of major importance in the diagnosis of pericardial effusion. Rapid enlargement of the cardiopericardial silhouette on serial films, separation of the mediastinal and subepicardial fat layers on a lateral chest film,[6] and decreased cardiac pulsations during fluoroscopy are suggestive, if present. More precise diagnostic technics are cardiac blood pool scanning and venous angiography utilizing carbon dioxide and/or opaque contrast media.

Materials and Methods

This study group consisted of 38 patients clinically suspected of having pericardial effusion. Examinations consisted of cardiac scanning and venous angiography with both carbon dioxide and opaque contrast in each patient. The patients were injected with two (several patients with four) millicures of Technetium 99m-labeled human serum albumin. Five to ten minutes later, the patients were scanned from the front while they lay supine. A 5 x 2 inch crystal rectilinear scanner with a 35 kiloelectron volt (Kev) window and 135 Kev baseline energy discriminator was used in most studies. The average scanning speed was 50 inches per minute. The scanning images were interpreted as negative or positive for pericardial effusion on the basis of (a) the relative size of the cardiac blood pool as visualized in scanning image compared to the transverse diameter of the heart on the chest radiograph, (b) the degree of separation of the cardiac and pulmonary blood pools, and (c) the separation of cardiac and hepatic blood pools.[10] The latter two findings often summate to produce a horseshoe shaped zone of decreased radioactivity surrounding the cardiac apex.

Following cardiac scanning, chest radiographs were made in the upright and left lateral decubitus position, utilizing an "overpenetrated" technic. The decubitus examinations were obtained with the patient lying on a stretcher against an upright bucky cassette changer. Then, with the patient in the left lateral decubitus position a 16 gauge needle was inserted into an antecubital vein and connected by a three-way stopcock to a tank of 100 per cent carbon dioxide. A 100 cc. syringe was attached to the stopcock and repeatedly flushed with carbon dioxide. Then 75-100 cc. of carbon dioxide were injected rapidly by hand, and two 14 x 17 inch films were exposed sequentially from a distance of 72 inches. The patient was kept in a left lateral decubitus position for at least five minutes (to allow resorption of the gas) and then turned into the right lateral decubitus position. Fifty cc. of either 50 per cent Hypaque or Conray 400 were injected rapidly by hand and two more 14 x 17 inch films were

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exposed in sequence. The procedure described above does not require the use of complicated or expensive serial multifilm changers or cine cameras, but uses only standard radiographic equipment.

With both angiographic technics, a convex band of soft tissue opacification was visualized between the right atrial cavity and the surrounding lung tissue. This was made up of the combined thickness of the pleura, pericardium and right atrial wall and measured 4 mm. or less in the normal adult.[7] In the presence of pericardial effusion, this convex soft tissue band was significantly wider. According to published reports,[7] a wall thickness of 5-10 mm. is equivocal and may represent either pericardial effusion or thickening. Thicknesses of 10 mm. or more are thought to be diagnostic of pericardial effusion.[7]

Results

Thirty-eight patients clinically suspected of having pericardial effusion were evaluated by cardiac blood pool scanning and by the two-film angiographic technic previously described. The results are noted in Table 1.

1. Twenty-four per cent of the patients (9 of 38) had no evidence of pericardial effusion by either angiographic (i.e., wall thickness of less than 4 mm.) or isotope technics. These patients were spared the potential hazard of a diagnostic pericardiocentesis.[5]

2. Thirty-four per cent of the patients (13 of 38) had evidence of pericardial effusion by both angiographic (i.e., wall thickness of 10 mm. or more) and isotope technics.. In forty-six per cent of the patients (6 of 13) the effusion was proved. In two patients pericardiocentesis revealed no fluid. The reason for this is unknown but previous communications have reported negative pericardiocentesis followed by proven effusion at the time of surgery.[9] Both patients in this series were treated medically with bedrest, diuretics and cardiotonic drugs. The patients became subsequently asymptomatic and radiographs revealed decreasing heart size.

3. Thirty-four per cent of the patients (13 of 38) had angiograms positive for effusion (i.e., wall thickness of 10 mm. or more) with negative cardiac scans. In seven of these patients the pericardial effusion was confirmed. The following is such a case report.

CASE REPORT

A 29-year-old white male, presented with congestive heart failure and pleural effusion. A tuberculin skin test was positive and granulomatous lesions were noted on pleural biopsy. The initial carbon dioxide angiogram was positive (Fig. 1A). Cardiac scan at the same time was negative (Fig. 1B). A repeat opaque angiogram, three weeks later, was still positive (1C). Cardiac catherization eight weeks after the original studies revealed restricted cardiac motion and pericardial effusion and/or thickening. At surgery, granulomateous pericarditis was found with the pericardium measuring approximately 2 cm. in thickness.

This case illustrates that clinically significant pericardial effusions may not be visualized on cardiac blood pool scans.

TABLE 1

Number of Patients	Co_2 Angiography	Opaque Angiography	Cardiac Photoscan	Fluid Proven by Pericardiocentesis, Serial Angiography or Autopsy		
				Yes	No	Not Done
9	Negative	Negative	Negative			9
2	Negative	Fluid or Thickening	Negative	2		
2	Negative	Positive	Negative	1		1
1	Fluid or Thickening	Fluid or Thickening	Negative		1	
11	Positive	Positive	Negative	6		5
13	Positive	Positive	Positive	6	2	5

Fig. 1A. Carbon dioxide angiogram showing evidence of moderate pericardial effusion.

Fig. 1B. The cardiac blood pool scan done within 24 hours of the venous angiogram in Fig. 1A was normal.

Fig. 1C. The opaque angiogram three weeks after the initial study was still positive.

4. Eight per cent of the patients (3 of 38) had fluid or pericardial thickening of angiography (i.e., wall thickness of between 5 and 10 mm.) and negative cardiac scans. In two of these a minimal effusion (approximately 100 cc.) was confirmed.

Discussion

Because of its simplicity and lack of mortality and morbidity cardiac blood pool scanning is a useful screening procedure. If the scan is positive no further diagnostic procedure may be required. However, because scans only detect relatively large effusions, a negative scan does not preclude a clinically significant effusion.[1,2] Friedberg[3] notes that the normal pericardial sac contains less than 50 cc. of fluid, and its maximal capacity without significant hemodynamic change is 100-150 cc. An acute effusion of 150-200 cc. may cause tamponade.[3] In addition, a bacterial pericarditis may produce effusions in the range of several hundred cc. which may remain undetected by scanning technics (Case Illustration). In this series, if venous angiography had not followed cardiac scanning, twenty-three per cent of proved pericardial effusions (9 of 38 patients) would not have been diagnosed. At least half of these were proved clinically significant.

It is therefore felt that negative cardiac scans should be followed by venous angiography. Both cahbon dioxide and opaque media are available as contrast agents. Occasionally a patient with a significant effusion has a negative carbon dioxide study and a positive opaque study.[8] This probably represents a flotation effect of carbon dioxide in the right atrium.[1] However, the selection of a contrast agent is not absolute and the following factors are to be considered. The timing with carbon dioxide is more flexible as carbon dioxide persists in the right atrium for several minutes, but the opaque contrast is cleared within seconds. The carbon dioxide may be injected through a small vein, but to get an adequate bolus of opaque contrast in the right atrium a large bore needle and vein are required (16 gauge needle). A free right pleural effusion may cause a false positive carbon dioxide examination whereas the opaque study is unaffected. There is a remote hazard of gas embolism using carbon dioxide.[7]

and a potential hazard of anaphylaxis using the opaque contrast. No morbidity or mortality was noted to either agent in this study. The primary contrast agent is now chosen based on examination of the individual patient. If a carbon dioxide examination is performed first and it is negative, an opaque study is then done. In this series three patients had negative carbon dioxide examinations with subsequent opaque angiograms showing fluid or pericardial thickening.

Summary

Thirty-eight patients with suspected pericardial effusion were studied by cardiac blood pool scanning and venous angiography utilizing both carbon dioxide and opaque media. Based on the results of this series an overall diagnostic approach was formulated. •

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Atrial infarction*

With Chronic Obstructive Lung Disease

John F. Howard, MD, San Francisco, California; John K. Leach, MD; Stanley Weitzner, MD; and Nicholas H. Zeller, MD, Albuquerque, New Mexico

Unrecognized atrial infarction may occur in patients with chronic obstructive lung disease.

INFARCTION OF THE CARDIAC atria is now recognized with greater frequency, coronary atherosclerosis being the most commonly reported cause. The unexpected occurrence of atrial infarction, documented at necropsy, in patients with chronic obstructive lung disease and cor pulmonale at the Veterans Administration Hospital, Albuquerque, New Mexico, prompted us to undertake the present study.

Seven cases of atrial infarction, of which four were in patients with chronic obstructive lung disease and cor pulmonale, were discovered among 2,083 consecutive autopsies (an incidence of 0.33 per cent) performed at this hospital from 1959 through 1968. A retrospective study of these cases including review of clinical, electrocardiographic, and autopsy data are reported.

CASE REPORTS

Case 1: A 67-year-old white man with a long history of chronic obstructive lung disease and heavy smoking was hospitalized in 1968 because of increasing dyspnea. The electrocardiogram showed a sinus tachycardia, right axis deviation, a 1 mm. negative P-R segment displacement in lead II, and a borderline abnormal P-terminal force in lead V_1. The patient expired ten days after admission. At autopsy the heart weighed 500 gms. There were right atrial and ventricular dilatation, an organized mural thrombus in the right atrial appendage, and a mildly sclerotic and patent coronary arterial tree. Microscopic examination of the right atrial appendage showed recent infarction. There was no evidence of myocardial infarction elsewhere. Pulmonary emphysema and an adenocarcinoma of the right middle lobe without cardiac involvement were also present.

Case 2: A 70-year-old Spanish-American man, with long-standing pulmonary silico-tuberculosis, was treated for congestive heart failure during his terminal illness in 1967. Electrocardiograms showed right ventricular hypertrophy and at different times a supraventricular tachycardia with varying degrees of A-V block and nodal bradycardia (Fig. 1 and 2). At autopsy the heart weighed 560 gms. All cardiac chambers were dilated. There was a mural thrombus overlying a 1.5 cm. area of scarred myocardium in the right atrial appendage. Microscopy showed healed myocardial infarction. The coronary arteries showed minimal atherosclerosis. There was advanced pulmonary silicosis and emphysema.

Case 3: A 49-year-old white man with advanced emphysema and rheumatic heart disease died in cardiac failure in 1959. Electrocardiograms had shown a wandering atrial pacemaker, premature atrial contractions, abnormal P-terminal force in lead V_1, and a P-pulmonale pattern. At autopsy, the heart weighed 700 gms. and showed enlargement of all chambers. There were rheumatic, aortic, and mitral valve deformities, and adherent mural thrombi in both atria. Microscopic examination of the right atrium showed a broad area of healing myocardial infarction. Coronary atherosclerosis was minimal. There were also organizing pulmonary emboli and pulmonary emphysema.

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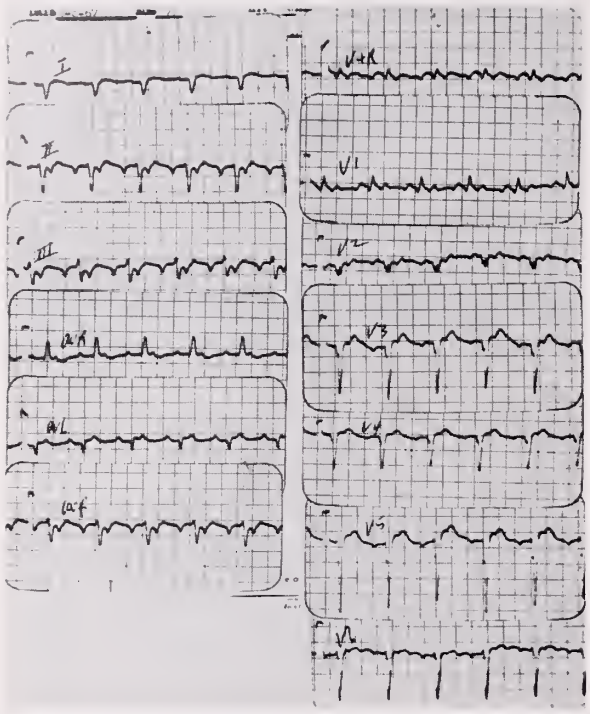

Fig. 1. Electrocardiogram five days prior to death showing right ventricular hypertrophy and supraventricular tachycardia with 2:1 A-V Block.

Case 4: A 46-year-old colored man with chronic obstructive pulmonary disease of many years duration was hospitalized in 1967 because of dizziness, nausea, edema and calf tenderness of the right leg. He expired suddenly on the morning following admission. Previous electrocardiogram showed sinus tachycardia, right atrial and right ventricular hypertrophy, and depression of the P-R segments in leads II, III, and AVF (Fig. 3). At autopsy the heart weighed 520 gms. There were right atrial and ventricular hypertrophy and dilatation. The posterior surface of the right atrium and the right atrial appendage were bluish-red. The right atrium contained a large mural thrombus. Microscopically the right atrium and appendage in areas showed recent myocardial infarction. The left atrium and ventricle were not remarkable and the coronary arteries were minimally sclerotic. There were also multiple pulmonary emboli and infarcts, pulmonary emphysema and acute duodenal ulcers.

Case 5: A 51-year-old Spanish-American man with aortic valvular disease died in intractable congestive failure in 1960. An electrocardiogram ten days prior to death showed first degree A-V block, biphasic P waves in lead III and notched P waves in AVR. At autopsy the heart weighed 575 gms. There were thrombi in both atria, right atrial and right ventricular dilatation, moderate left ventricular enlargement, and calcific aortic stenosis. The right atrial appendage was focally hemorrhagic and microscopically showed recent infarction. The left atrium was not remarkable. The coronary arteries were widely patent and slightly sclerotic. There were also multiple pulmonary infarcts.

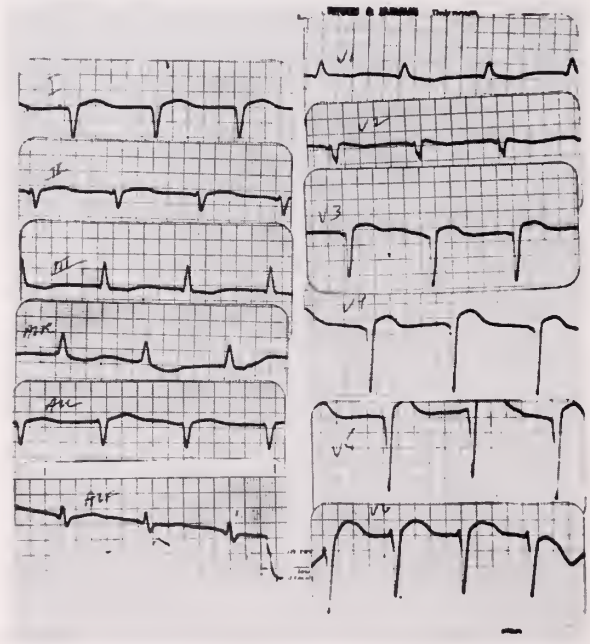

Fig. 2. Electrocardiogram on day of death showing nodal bradycardia.

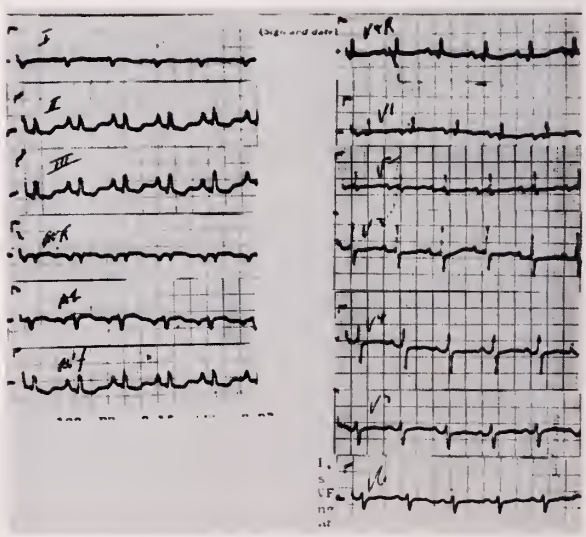

Fig. 3. Electrocardiogram during final hospitalization, showing right atrial and right ventricular hypertrophy and depression of P-R segments in leads II, III, and AVF.

Case 6: A 58-year-old male hypertensive American Indian with hemangiopericytoma of the liver and recurrent hypoglycemia for several years died in 1966 following massive intestinal hemorrhage. A diagnosis of arteriosclerotic heart disease with myocardial infarction was made in 1963. One year before death an electrocardiogram showed biphasic or notched P waves in leads III, AVF and V_1 with an abnormal P-terminal force in V_1. At autopsy the heart weighed 450 gms. There were moderate dilatation of all chambers, recent and old infarcts of the interventricular septum, and focal reddish-blue discoloration of the left atrial appendage with a mural thrombus. There was severe sclerosis of the coronary arteries with complete occlusion of the left anterior descending branch. Microscopic examination of the left atrial appendage revealed recent infarction. The hemangiopericytoma of the liver extended into the wall of the duodenum. The bowel contained a moderate amount of fresh blood. There were recent splenic infarcts and multiple emboli in branches of the splenic artery.

Case 7: A 59-year-old white man with advanced portal cirrhosis died with pneumonia and gastrointestinal bleeding in 1967. Several months prior to his demise renal biopsy disclosed proliferative glomerulonephritis. During the months prior to his death electrocardiograms showed nodal bradycardia and T wave changes suggestive of ischemia (Fig. 4). At autopsy there was acute fibrinous pericarditis. The right atrial appendage was enlarged, firm, reddish-blue and contained a mural thrombus. Microscopic examination of the right atrial appendage revealed recent myocardial infarction. The remainder of the heart was not remarkable. The coronary arteries were essentially normal. Other findings were subacute glomerulonephritis, portal cirrhosis, and pulmonary hyaline membrane pneumonitis.

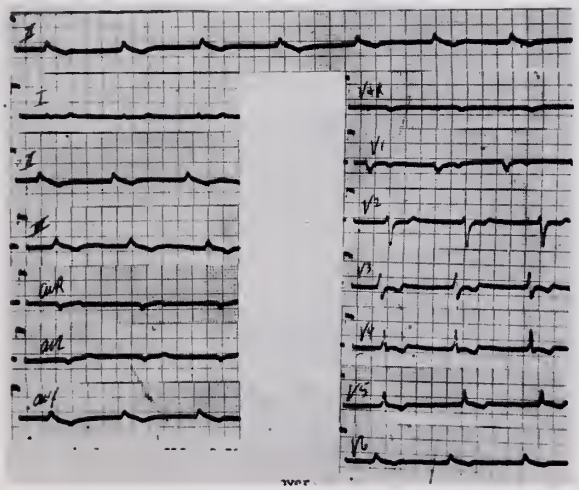

Fig. 4. Electrocardiogram showing nodal bradycardia.

Discussion

The actual incidence of atrial infarction is difficult to determine, since the cardiac atria are often not carefully examined at autopsy. An excellent study of the normal anatomy of the cardiac atria and of the gross and microscopic findings in atrial infarction has been offered by Söderström.[1] Cushing et al reported atrial infarction in 1.15 per cent of 2,704 consecutive autopsies.[2] Wartman and Hellerstein found an incidence of 0.85 per cent in 2,000 consecutive autopsies.[3]

Arteriosclerotic heart disease, with or without occlusion of the coronary arteries, has been cited as the most common cause of infarction of the atria.[1] However, four of our patients with atrial infarction had chronic obstructive lung disease and cor pulmonale, and essentially normal coronary arteries. It would seem plausible that in these cases a relative hypoxia in atrial tissue secondary to severe pulmonary disease and elevated intra-atrial volume and pressure burdens may well have contributed to these infarctions. In this respect Söderström described the occurrence of isolated atrial infarcts in patients with long-standing congestive heart failure. Infarction of the atrial wall or sinus node has been associated with arteriopathy of primary pulmonary hypertension,[4] progressive muscular dystrophy,[5] and Friedreich's ataxia.[6] Necrotic foci have been produced experimentally in the atria following the administration of isoproterenol and mineralocorticoids.[7]

Right atrial infarction occurs more commonly than infarction of the left atrium.[1-3,8] In our series, six of the seven patients had infarction of the right atrium or appendage. It has been postulated that the high oxygen content of the left atrial blood, which may reach the atrial musculature via the Thebesian veins, offers a safeguard against frank infarction of the left atrium.[1,2]

Many investigators have reported that atrial infarction is usually found in association with ventricular infarction.[1-3,9] Only one of our patients, Case No. 6, had a ventricular infarct.

No clinical signs or symptoms are characteristic of atrial infarction, and serum enzyme determinations do not help in making

the diagnosis.[9] The electrocardiogram is the most valuable aid in the ante-mortem recognition of this entity. Premature atrial contractions, wandering atrial pacemaker, paroxysmal atrial tachycardia, all degrees of atrioventricular block, and nodal rhythm have been observed in patients with atrial infarction.[1,2,8,10-12]

Low voltage and changes in the configuration of the P wave have also been reported in atrial infarction.[1,9,13] The abnormal P waves may be diphasic, split, notched, inverted, slurred, or flat and broad. An initial negative deflection in a diphasic P wave—an uncommon finding — has been called the "atrial Q wave," and is thought to indicate atrial infarction in the same way that a diagnostic Q wave suggests ventricular infarction.[2,9]

The PT_a complex is seen in its entirety in complete heart block,[13,15] but when conduction is normal, atrial repolarization (T_a) is lost in the QRS complex. Several authors have presented cases of documented atrial infarction with P-R segment (i.e., what can be seen of the PT_a segment) deviation from the isoelectric line shortly before death.[2,8,10,11,16-18] This displacement has been considered analogous to the ST changes seen in ventricular injury. In experimental atrial infarction, PT_a displacement and changes in P wave ampitude and configuration have been produced by some investigators[18-20] but not by others.[2]

The complications of atrial infarction are arrhythmias and conduction disturbances (74 per cent)[2,21] atrial mural thrombosis (84 per cent)[1,2,13] and rupture of the atria with cardiac tamponade (rare).[2,22-25] The clinical implications of the appearance of arrhythmias and conduction disturbances in acute myocardial infarction have been well investigated. In certain cases it is possible to predict the site of the atrial as well as the ventricular lesions and the location of the coronary artery occlusion.[10,11,20,21]

Right atrial thrombi may embolize to the lungs (a possibility in cases 3, 4, and 5), and mural thrombosis in the left atrium may give rise to arterial embolism (case 6).

While arteriosclerotic heart disease seems to be the most common cause of atrial

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infarction, chronic lung disease with cor pulmonale can produce the same lesion and electrocardiographic changes. It is suggested that atrial infarction due to chronic lung disease is more common than is suspected, and that closer attention to electrocardiographic abnormalities may lead to greater recognition of atrial infarction.

Summary

Seven cases of atrial infarction, discovered at autopsy, are presented. Four occurred in patients with chronic obstructive lung disease and cor pulmonale without significant coronary atherosclerosis or ventricular infarction.

Arrhythmias, conduction disturbances and P wave abnormalities, in patients with chronic obstructive lung disease, should suggest the possibility of an associated atrial infarction. Other complications of atrial infarction, such as atrial mural thrombi with embolization or atrial rupture with tamponade, may occur. •

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MATERNAL MORTALITY

The following cases have been reviewed by the Colorado Maternal Mortality Committee* and selected for publication because of their educational value.

Maternal mortality—Pyelonephritis in pregnancy

Although we are all aware of the insidious nature of pyelonephritis and that only twenty per cent of the sufferers of this disease are diagnosed during their life-time,[1] we continue to find evidence that the ultimate effects of the disease, especially in pregnancy, are still discounted by some. It has been pointed out in several studies that pyelonephritis is and should be a preventable disease of pregnancy[2] yet our case this month deals with a maternal mortality which was undoubtedly due to pyelonephritis.

CASE REPORT

A twenty-five year old female was admitted to the hospital June, 1969. Her chief complaint was vomiting and headache of two days duration. On physical examination the patient was found to be twenty-two weeks pregnancy with symptoms of a urinary tract infection. The laboratory data was: Blood urea nitrogen, 14; specific gravity, 1.018; C.B.C. within normal limits; S.G.O.T., 26. She was treated with Gantanol, Azotrex, Pyridium and Panalba. No fever was noted during the hospital stay. The patient was discharged against medical advice sixteen days later. She still had pyuria.

Three days later the patient was re-admitted with migraine headache, hysteria and acute cystitis. Obstetric, psychiatric and medical consultation were obtained and the diagnosis was: gravid female with a normal size uterus for her gestation with fetal heart tones, who was suffering from acute anxiety neurosis with non-psychotic organic brain lesion and acute pyelonephritis. Urine and blood cultures revealed aerobacter aerogens; coliform organisms, resistent to Sulfa. She was treated with Acromycin, I.V.; oral Terramycin; packed cells; I. M. Cortisone; I. V. Hydrocortisone; and Digitalis. The following day her temperature was 102.6 degrees; B. P. 140/60; B.U.N. 101 milligrams per cent. She was treated with Keflin, Mercuhydrin and further steroids. Her blood volume was 3.4 liters; her blood pressure began to drop and could not be stabilized with Aramine. The patient expired thirty-four days after her first admission. No autopsy was performed.

Discussion

The past history of this patient is most revealing as we are shown a picture of a woman who had been hospitalized twenty-one times in a nine year period with numerous somatic complaints. Her first abnormal urine appeared in October, 1966, and there was no record of her receiving treatment. In 1967, she had cystoscopy and urinalysis for dysuria, both were negative. In 1968, she received Acromycin for bacteruria and hematuria. The following year her urine had ten to fifteen white cells when tested.

There seems to be good evidence in her history of chronic pyelonephritis yet, perhaps because of the immediacy of her presenting complaints on all the hospital admissions, her infection went unnoticed or untreated. Benign as this disease appeared, it was listed as the cause of death with brain, heart, and kidney abscesses, less than three years after the patient had had laboratory results confirming an infection. •

*The following physicians have been appointed to serve on the Maternal Mortality Committee, a subcommittee under Maternal and Child Health: Horace E. Thompson, Chairman, E. N. Akers, Maxwell A. Abelman, L. Joseph Butterfield, Warren E. Cooper, Gerald W. Del Junco, Lawrence W. Roessing, all of Denver; John H. Darst, Greeley; Harold L. Dyer, Colorado Springs; Richard R. Hansen, Fort Collins; Ronald E. Harrington, Boulder; James R. Patterson, Englewood; Louis C. Wollenweber Jr., Lakewood.

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Getting the parent off the hook*

Walworth R. Slenger, MD, Albuquerque, New Mexico

Get With It!
So speaks the author to parents and to fellow physicians confronted by today's young people.

THIS JOURNAL AND OTHERS have recently published information that concerns the use of drugs and the importance of the physician having some knowledge about drugs and young people. The physician sees parents that are deeply troubled about the actions of their kids; usually he himself has children and it may be that they are not entirely a comfort to him, particularly if they remind him of the generation gap. While the problem of narcotics and the problem of dangerout psychedelic compounds is large in the mass media, the physician above all must be able to separate medical considerations from legal—*de facto* from *de jurae*. I believe that psychologic considerations are inseparably connected with the *de facto* use of drugs. It is the intention of this paper to deal with some of those psychologic facts and to describe how they interlock with a cluster of psychologic problems with which both teenagers and their parents grapple in a confrontation that is agonizing.

A student came to me the other day stating that ". . . there are too many revolutions for me to keep up with. The Black, the Student, the Clergy, the Women, the Right, the Left and Middle America all are involved with polarizing confrontations and it is too much for me . . . cops and narcs are clergymen with guns; the radio plays "The World Tomorrow" at me every night and I am always hearing about explosions, pollution, population, pot and pills. I'm tired." What about parents? Are parents tired?

Most of the parents that we know have traditions. We live under Law. We believe in the virtue of reason. Will power is good. Structure and order are necessary today as much as in the days of Hamilton, Madison, Jefferson, Emerson and Holmes. A value system is necessary for social beings, and a will to conform to it is an essential portion of being a citizen who lives in peace with his neighbor. The physician believes in value systems.

Certainly it seems that value systems can become involved with what might hopefully be clear cut medical problems. The problem of prescribing a contraceptive pill is an example.

When I read in a November '69 issue of *Time* that twelve college student health services were known to prescribe it, I was stunned by the thought of how offensive this might be to an assortment of parents. But then, the physician has long been accustomed to taking a non-value-judgment attitude to problems of venereal disease. Increasingly also he has been learning to see the medical-psychologic-social problem of the drug-using subculture and separating it from the legal entanglements and moral judgments. Value systems can be involved in medical attitudes as well as detached from them.

The physician better than any professional that I can imagine is aware that the will represents a small portion of the mind, and that the corticospinal system likewise is merely a small part of the brain. The control system, in other words, is dwarfed by other

*From the Student Health Service, University of New Mexico.

important systems. People who are able to recognize merely the executive agencies in mind-brain, merely this portion of themselves, are usually not aware of other important parts, e.g.: feelings and the autonomic system — the non-cortical systems. These, in terms of brain mass and personality mass, really represent a "silent majority" within. These systems have to do with sex, violence, and rebellion. When young people articulate their ideas about these, or merely express them in behavior, p a r e n t s get hooked. Who are these parents?

Mostly they are middle-class people who have arrived in the affluent and technologic society and are alarmed at any suggested threat to its stability. They are usually good people. They frequently have an information deficit. These people have many estimable character traits, one of which is to be restrained about dealing with impulses and to be silent and non-complaining about the pain of the human condition. If this trait is high level in intensity, pain is not expressed until it is overwhelming, and then it comes on eruptively, in open protest, or, even more unfortunately, in the form of psychosomatic systems.

Parent Problem

This is the sort of thing I hear from parents, "Doctor, I am terribly concerned about my kids. I'm not illiterate or stupid. I read a lot. For example, Kenneth Kenniston's two books about the alienated youth in our society and the committed young radicals; also many articles in the slick magazines. I am aware that we are in a period of ferment and change. You and I share this. But I need help. What can you tell me that will enable me to calm down about this Gwendoline of mine? She is 15, intelligent, pretty, popular. But she has these ideas: e.g., anyone over 30 is irrelevant and so is anything that they have to say. I believe that I have some things to learn, and I believe I know some of the facts of life. Society has to have structure. Amercians have had a system and laws, and the citizens consent to be governed by them. I know that youngsters in their growth period need protection. I think that they should be protected from some kinds of information that they can't handle, because they lack the experience or don't have the information to make decisions about the value of some startling inputs.

"On the Laugh-In show the other night, Gwen and some other youngsters heard a girl performer say, 'Now that we have the pill, going to college isn't such a worry. Ho, ho ho ho!' I was mad enough to smash the tube. How can she compute an idea like that at her age? I'm glad there wasn't a pill when I was her age. Fear of the Lord, fear of breaking rules, fear of pregnancy were very strong in me—and thank God for that.

"Another thing the experts say: if we love and understand our children they won't have problems. I intensely love and do my utmost to understand Gwen. So the experts have no meaning for me. What do you think about fear? Can't fear be good, valuable, protective?

"Some psychologists say that fear is bad. Some writers, novelists, sociologists and authorities dismiss the puritan values of control and restraint as museum pieces—non-modern. I read an article about post-modern man, another about the post-Christian era and about the post-ideologic man. Physicians say that restraint and control of feelings cause phychosomatic illnesses and contribute to the cause of diseases like ulcer and heart disease.

"Love means caring. I get this from Eric Fromm and my pastor. I *do* care for my kids; actually I care for all children. I know that lack of care, as represented by inadequate diet, social and intellectual stimulation, results in syndromes, such as psuedo-mental retardation. My daughter and her friends have lots of care. Also they are quite smart. Do you think they haven't received enough fear?"

I interrupted this parent and reported, "Robert M. Coles says, 'I have cast as keen a clinical look as I could upon them and found little evidence of psychopathology. If they are predominantly not psychotic, not antisocial delinquents, not alcoholics and not addicts, then what are they? In large numbers they are the first generation of youths to have grown up under the terrible shadow of nuclear war.'"

I went on to say, "The people under 25 in a strange sense are our therapists, somewhat

in the way that the Greek Chorus told the audience 'how it is.' One of the myth-beliefs held by young people is that elders tend to be reductive in all transactions. There is some argument in support of this. Any elder who is going to make it with younger people must have level vigilence and internal monitoring in order to avoid coming on in a way which will support the position: *Elders are Reductive* (e.g., you are just a radical rebel . . . or . . . you are only a red-diaper-baby).

"I have found that young people have a fascinating measure of self-acceptance and need to express feeling freely about themselves. In former times this, in the puritan ethic mode, had the meaning of lack of self-control. I do not believe that that is so, at this point in time. Remember the Marine Corps saying: 'A good soldier beefs all the time.' We must learn to listen without being afraid that the anger will be translated into action."

Fears and Anxieties

My patient-parent went on, "Yes, they have the Bomb to fear. They have heard more about violence and genocide than any generation of Americans. They have spent more hours in front of the TV tube than they have in school. Even my two-year-old can get a clearer picture on it than I can. And he watches monsters and galactic criminals and demons . . . not merely on the programs, but on the commercials which also instruct him to wear-out, waste, use up. They repeat and repeat that he has a right to all the luxury that his Daddy's credit cards can supply. He sees much of violence and destruction. Do you suppose that seeing so much of that sort of thing makes children non-fearing . . . are they being conditioned to NOT fear?"

I replied, "The psychologist does talk about the counter-phobic defense. As children, many of us on encountering a blind person for the first time, imagine what it would be like to have such a handicap and go through some experiences pretending to be blind in order to overcome the fear of the reality. Children imagine their parents to be dead for the same reason. A childhood nightmare that the mother is dead is much less likely to be a primary death-wish than an attempt to experiment with the idea of being abandoned. I believe that our mass media give a boost to the natural counterphobic defenses."

"Well, doctor, I'm also full of ideas about conditioning and behavior modification, reinforcement and extinction. I read Skinner's Walden II. I hear what is being done in mental hospitals and in the management of kids in Head Start and with Special Education. But I haven't any idea about how to modify the behavior and attitudes of my kids. Non-sick and non-deprived kids are, it seems to me, non-candidates for Behavior Modification. You can't get them into a controlled situation in the first place. Besides, they are too smart and the rewards given to reinforce change would be sneered at. Gwen's allowance lets her buy enough candy so that an M&M pellet wouldn't accomplish a thing. Do Behavior Modification technics offer anything to intelligent kids in an open environment?" I answered, "At the present time I do not believe that they do."

This exchange occurred between me and a parent: "Bill, damnit, I have been as good a father as I know how to be. My seventeen-year-old daughter is demanding that she take a car back to school between semesters. At the table I was commenting that some of her friends had recently turned over a small car on a hairpin turn. She pointed out that none of them had been hurt. But that wasn't the point, and I said so. She stormed out saying: 'I've had enough of this funky family.' This reduced me to shambles. Mostly because I can't stand that kind of reaction to me and that kind of language. And I'm responsible for that car and what happens when it's driven. Further, I know more about driving on mountain roads than she does. I can't put a lethal weapon in the hands of a child. My conscience won't let me."

"Would you be labled non-loving if you withheld the car?"

"Certainly, by wife and kids both."

"Would you be loved more if you were indulgent?"

"No."

"Well, at the moment, it seems to me that you have to live with your guts and your conscience and that this collides with your picture of yourself as an indulgent father. OK?"

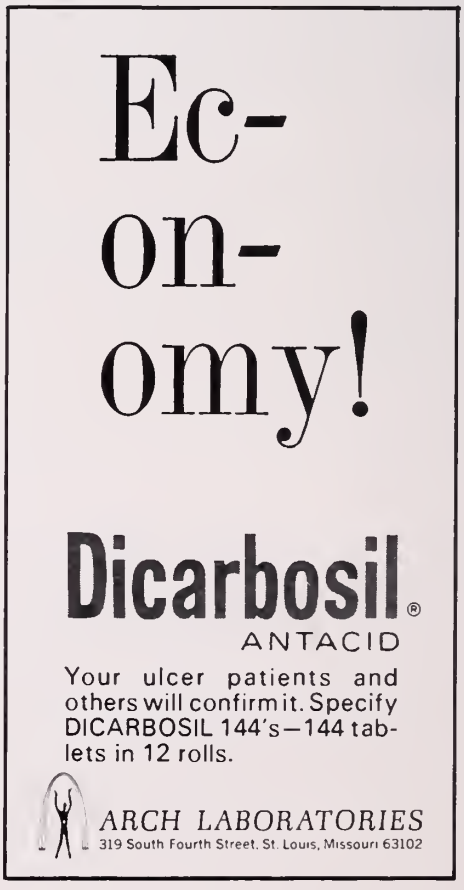
If there is anything to the population explosion, or the pollution explosion, we must seriously consider the information explosion. This has nothing to do with parents. Further, we are not able to keep up with the demand of an adolescent who is demanding logical reasons for ethical standards which we didn't examine ourselves at his age. Fear of eternal damnation as a consequence of breaking rules is rarely observed in my sample of young people. I'm impressed with the number of them that observe the interlockingness of the ecologic facts of life, e.g., more automobiles to permit more freedom to go to places where there are traffic jams.

The ecologists are now informing us that there is so much information about how we are ruining the earth that a systems approach is our only salvation. And, furthermore, even the simplest ecosystem is so complex "that the largest computer cannot fully unravel it." (*Time* 2-2-70, p. 62-63). Our young people have vast amounts of information that we lacked in our own formative years. I think that it is important to keep that in mind. Furthermore, our own myth-belief systems are very laughable to them: All judges and senators are the epitome of rectitude; all professors are wise and none have personality deviations; bankers and corporation high officials are patrons of Beaux Arts, are known for their sensitivity to the humanities and are concerned about oppressed people; no one in his right mind would ever break the law; only degenerate people have anything to do with evil; everyone is a patriot, worships God and says with Stephen Decatur: "May my country always be right . . . but my country, right or wrong." Attorneys are the sons of Solon; military people are sons of Pericles; physicians are sons of Aesculapius, Hippocrates and Galen. Young people have frequently a sharp ability to articulate attacks on these traditions and slogans.

Role of the Physician

How does the family doctor get the parent off the hook? First, I suppose he will best be able to do this in terms of the hook he may be on himself and what he has done to get off it himself. He has an experience of some years duration which is certainly going to be helpful when he sees a man 45, prematurely white-haired with long ears and a chief complaint of fuzzy sensations on the soles of his feet, he is able to look for a macrocytic anemia automatically. The physician is accustomed to inviting people to look for more information to explain what is happening to them. The seasoned physician, I hope, has watched the life cycle long enough to have a profound respect for young people and patience with them. The physician has learned to become panic-proof, relatively, while at the same time preserving his intuitive and empathic self that is capable of sympathies in different directions and across different categories. And he is able to listen.

How to get the parent off the hook? Listen! With every bit of your objective compassionate data processor. By that, I mean that the skillful and nonjudgmental listener can aid a tormented parent to loosen up the impactions of hurt, angry frustrations. He can be very therapeutic in this way. He helps the troubled parent feel less lonely. And for his own benefit, he feels like a complete physician.



A cynical friend of mind has read this passage and raised the question: What kind of therapy might I be recommending for the doctor? And further, the possibility that some Bourbon might be the best therapy that a doctor might think of. In such a case, were that to be so, he is hooked in the same way that are many of the parents who require a good listener. It may be obvious, then, that my own unhookedness will be a powerful instrument in helping to unhook the troubled parents of what to me is the most interesting generation of young Americans that has ever come upon the scene of this world. They seem to share with our early Puritan forefathers what to me was and is an important set of conceptions—that there is absurdity, chaos and pathos in the universe and that these must be balanced by awareness of some laws. Rational Law was and still can mean that a man's mind can talk to Plato. Natural Law was and still can mean that there is a necessity for some cunning, fox-like craftiness like the legendary Vulpine Ulysses. Many of the young people I see have some facility in making these distinctions.

If, as is frequently said, we live in a post-ideologic world, in a demythologized society, and if young people suffer from this, and if their parents are suffering also because of their confrontation with them, the doctors need a prescription, too. Many have taken the recipe—*Get with it!* And if the physician does this he rises to the potentials that tradition looks for in him. •

PRIZE ESSAY COMPETITION

The Trustees of the Caleb Fiske Fund of the Rhode Island Medical Society, the oldest medical prize essay competition in America, announce two subjects for the 1970 essay contest:

"The Crisis with Hallucinogenic Drugs—Possible Solutions"
and
"Human Cell Cultures in the Diagnosis of Disease"

A cash prize of $500 is offered for the best dissertation on either subject. Essays must be submitted by December 15, 1970, and must be typewritten, double-spaced, and not in excess of 10,000 words.

For additional information write to the Secretary, Caleb Fiske Fund, Rhode Island Medical Society, 106 Francis Street, Providence, Rhode Island 02903.

A medical potpourri

Compiled by Andrew M. Babey, MD, Las Cruces, New Mexico

1. "Computational approaches to diagnosis might have been useful 40 years ago but are often obviated today by the modern precision of *individual pathognominic paraclinical* tests. With the aid of radiography, biopsy, cytology, endoscopy, and diverse laboratory procedures, many diseases can be accurately identified today without the use of complex inferential logic or statistical computations of probability. The major intellectual need in diagnostic procedures is for a better way of choosing the tests rather than calculating the names of diseases. Such improved strategies cannot be devised and checked, however, until appropriate clinical algorithms are constructed to demonstrate the flow of logic in the diagnostic "workup" and until appropriate medical data are assembled to show the values and risks of paraclinical tests at each step in the logical sequence. The construction of such algorithms and the assemblage of such data require attention not to computers and statistics but to the basic ingredients of clinical reasoning and clinical goals." Feinstein, Alvan R., MD, Computers in Medicine, Medical Tribune, 9/29/69, p. 15.

2. "Carcinomatous myopathy affects the muscles of the limb girdles and trunk. Patients have difficulty in turning in bed, rising from the lying or sitting position, and negotiating stairs, because trunk and pelvic—girdle muscles are weak. Combing hair or hanging washing on a line may become impossible for a woman or shaving for a man because of weakness in the shoulder muscle. Muscular fatigue at times responds, partially or completely, to treatment with an anticholinesterase and hence resembles myasthenia gravis, dermatomyositis, or polymyositis. The diagnosis of carcinomatous myopathy should be considered when the patient also has dysaesthesiae or the tendon reflexes are depressed beyond the field of weakness." Leading Articles, British Medical Journal, July 26, 1969, p. 193.

3. "Most hematologists now agree that therapy of chronic lymphatic leukemia in its inactive or asymptomatic form may promote progressive disease activity and the development of one or more complications leading eventually to death. A patient with chronic lymphatic leukemia and a leukocystosis as high as 100,000 cells or more, even if associated with mild splenomegaly and minor adenopathy, should not be treated unless complications are evident. Some patients will live for years with such a mild form of the disease that they are either totally unaware of its existence or notice only a slight adenopathy. In addition to therapeutic measures that may precipitate progression of the chronic leukemic process, elective surgical procedures may also cause activity and should be avoided in most circumstances." Norcross, John W., MD, Chronic Lymphatic Leukemia in the Older Patient, Geriatrics, Nov. 1968, pp. 153-154.

4. "In his interpretation of history, Adams belonged to the Old World, not the New. As he surveyed history—a survey that covered more than a score of societies—he found men and governments everywhere the same. Men were creatures of greed, ambition, vanity, passion; all were animated by an ungovernable lust for power; all governments tended to tyranny. And from this reading of history Adams drew conclusions that he thought were inescapable. If human nature and government were everywhere the same, what reason was there to suppose, or even to hope, that they would be different in America? Adams looked about him and concluded that indeed they were not different, and the moral lesson that he then drew from history was clear and simple: the supreme task of statesmanship was to contrive so many checks and balances that the innate depravity of men would be frustrated." Commager, H. S., The Americanization of History, Saturday Review, Nov. 1, 1969, p. 25.

5. "Where Adams saw history as retrospective, Jefferson saw it as prospective. Adams took for granted that Americans were prisoners of the past, doomed forever to repeat the errors of the past. But Jefferson was confident that man was not the prisoner of history, but might triumph over history; that he was not condemned forever

to repeat the errors of the past but could avoid them; that human nature was not always the same, but that in a new and favorable environment—physical, political, and cultural—human nature itself would change." Ibid., p. 25.

6. "I like the dreams of the future better than the history of the past, Jefferson wrote to Adams, who was not much given to dreams." Ibid., p. 25.

7. "The commonest cause of transient blindness in one eye is carotid insufficiency. This condition has a predilection for the male sex in the second half of life and is commoner on the left side." Rose, F. Clifford, M.R.C.P., Current Practice, British Medical Journal, 9/27/69, p. 763.

8. "At least 25 per cent of patients with temporal (giant cell) arteritis become blind in one or both eyes. There may be warning attacks of transient blindness, and immediate treatment with steroids can save vision. The diagnosis should be suspected in any patient over the age of 55 with headache or generalized pains (polymyalgia rheumatica); if the sedimentation rate is over 50 mm. in 1 hour. Steroids should be given without waiting for the result of temporal artery biopsy, which is not infrequently negative for giant cells." Ibid., p. 764.

9. "Government is the cooperative instrument of the people. The people want more and better medical care. Physicians and their families represent less than 1 per cent of the total population of the country; and the organization, financing, and delivery of medical care is too important to be left solely to physicians." Cohen, Wilbur J., Letter to the editors, Medical Economics, Nov. 24, 1969, p. 117.

10. "The important thing is not so much that every child should be taught as that every child should be given the wish to learn." Lubbock, John, Thoughts on the Business of Life, Forbes, Sept. 15, 1968, p. 110.

11. "The big teaching ward-rounds of the past—now being resuscitated under the grandiose name of "grand round"—are, I believe, an anachronism and an unjustifiable upset to hospital work and patients. The spectacle of the great man arriving in state, greeted by a retinue of acolytes, then sweeping round dropping obiter dicta and repeating old jokes which respectful juniors are expected to find still funny, and ending up with the use of the deferentially guarded towel and the sipping of refreshment in Sister's office, all provide good television or stage material for a master such as James Robertson Justice. But in fact the instruction it provides is slight, and the distress caused to patients isn't always appreciated. Bedside instruction should surely only be given on a single, willing patient wheeled into the privacy of a side-room, and all new hospitals, whether "teaching" or "non-teaching", should have facilities for this to be done." Williams, Bryan, MD, Personal Thoughts, British Medical Journal, Oct. 18, 1969, p. 165.

12. "Perhaps one of these days we shall reach a less permissive plateau in education and in other things, and we may then heed the century-old view of Huxley: 'The most valuable result of education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not'." Ibid., p. 165.

13. "The description of an episode lasting 5 to 10 minutes of a sudden visual impairment in one eye which ascends or descends "like a curtain," sometimes going on to total blindness, is diagnostic of transient failure of retinal circulation. Total recovery of vision is the rule in the first few attacks. There are variations on this theme, but the essence is the monocular quality of the episode. Such a history in the presence of signs of extracranial vascular disease—which are discussed later—indicates with some certainty that these episodes are due to platelet micro-emboli." Hutchinson, E. C., MD, F.R.C.P., Current Practice, British Medical Journal, October 4, 1969 p. 32.

14. "The presence of a significantly raised diastolic blood pressure during or immediately following an episode of cerebral ischaemia is a common clinical observation. This is particularly true in an episode involving the vertebrobasilar circulation when the diastolic blood pressure may reach alarming heights and then return to normal within hours or days." Ibid., p. 33.

15. "Scepticism on the effectiveness of any method of treatment to counteract the late effects of degenerative vascular disease is understandable and desirable in the absence of properly controlled trials. There is one circumstance where the clinical presentation may suggest an urgent need for referring the patient to a unit experienced in the handling of the problem. Ideally the patient is in the middle or late 50s, physically well preserved, with no significant vascular disease elsewhere. The presenting complaints of repeated transient episodes in the carotid or vertebrobasilar circulation are associated with a bruit in the neck over the appropriate major vessel. Subsequent contrast radiology demonstrates a clear-cut stenosis of this vessel, and subsequent surgical treatment results in removal of an ulcerating atheromatous plaque with its obvious potential for producing massive emboli or platelet micro-emboli. If surgery is precluded for whatever reason there is some evidence that the use of anticoagulants in these circumstances may be of value." Ibid., p. 35.

NEW MEXICO

A Cleft Palate Team functions as a relatively unpublicized service of the Rehabilitation Center, Inc., Albuquerque, New Mexico. It serves in an advisory capacity to coordinate the several medical and paramedical disciplines required to habilitate children afflicted with cleft palate and/or cleft lip defects. The team evaluates the problems of the child on a continuing basis and communicates its findings and recommendations to the appropriate professionals concerned with treatment of the child. Only speech therapy and social counseling are provided at the Rehabilitation Center.

Statistically, cleft palate defects occur at the rate of one in approximately seven hundred live births. The rate is slightly higher among the Indian populations. On the basis of birth statistics in New Mexico, some 31 children are born with cleft defects each year. In 1969 the Cleft Palate Team examined 26 new patients and provided continuing supervision for 47.

The Rehabilitation Center is located at 1023 Stanford Drive, N.E., Albuquerque, New Mexico. Telephone 255-5501.

UTAH

Brigham Young University

Plague in Utah is not really a problem—although it has a tremendous potential. This observation was made this week by Brigham Young University flea expert Vernon J. Tipton, MD, following the recent death of a young New Mexico girl with bubonic plague. Newspaper reports indicated that she was the state's fourth bubonic plague victim and one of six plague cases reported in the U.S. this year. Four of the six cases occurred in New Mexico; three are now recovering.

Fleas carry plague from various wild animals, and Utah has at least 115 kinds of fleas. Utah and all states west of the 100th meridian have a great plague potential because plague occurs naturally in the wild animal population (Sylvatic Plague) and there are many flea species capable of transmitting the disease to man. Another type is Urban Plague found on city rats.

Major outbreaks of plague in the U.S. have been in the West and chiefly in Los Angeles and San Francisco. A possible reason for these two cities having a greater number of cases is because of their commerce with oriental ports where plague is believed to have had its beginnings. Few cases in the U.S. have been detected east of the 100th meridian and most of these have been in seaports along the east and gulf coasts.

Dr. Tipton is one of five leading experts in the United States on plague epidemiology and classification of fleas, and has traveled throughout the world on various military and government assignments. He studied plague in Africa and spent six months in Madagascar working with French plague specialists.

MEDICAL SCHOOL NOTES

University of New Mexico School of Medicine

Ten times as many medical magazines—over 25,000 titles—are now available for use by New Mexico physicians, nurses and other medical personnel, through a cooperative library arrangement of the New Mexico Regional Medical Program (RMP).

The RMP Health Sciences Information Center, located in the University of New Mexico School of Medicine library, has joined a cooperative library project called TALON. Organized January 1 of this year, TALON expands the state's medical reference service which began in 1968.

TALON—representing Texas, Arkansas, Louisiana, Oklahoma and New Mexico—includes 11 libraries which will "pool" their resources in an attempt to offer complete service to the South-central region. The University of Texas Medical School at Dallas is serving as administrative headquarters.

By joining in The Library Co-op, New Mexico increases its available periodicals from 2,500 to over 25,000 titles.

The TALON libraries are connected by teletypewriter and can usually provide reference and bibliography service within 48 hours. If the information cannot be located through TALON, requests go to another regional medical library or to the National Library of Medicine and take about five days to fulfill.

TALON is one of 11 regional libraries established across the nation. Together the libraries form a nationwide biomedical communications network which ties in to the National Library of Congress, ERIC (Educational Resource Information Center), National Communicable Disease Center, Department of Defense and many others.

As a back-up to library reference searches made by RMP staff, computer searches can also be made through MEDLARS—Medical Literature Analysis and Retrieval System. The computer searches take about two weeks to complete, and for the most part cover material printed within the past three years.

The Information Center also sponsors a Dial-Access Tape program, whereby doctors, nurses and other health personnel may call a toll-free Albuquerque number and hear a six-minute tape on any of over 300 medical subjects. A complete listing of the tapes is available from the Center.

Both the information search and the tapes have proven especially valuable to the "isolated" doctor working alone in a small community. By having easy access to the most recent medical developments, he has the reassurance of a professional "consultation."

The Information Center will arrange for consultations directly or by telephone with doctors or other professionals who may be specialists in a particular field of medicine.

The Information Center is also completing a Health Manpower Registry which lists all physicians in the state by area of specialization, plus information on nurses, pharmacists, social workers, nutritionists, laboratory technicians, occupational and physical therapists, rehabilitation personnel, dentists and other health personnel.

The goal of the Information Center is to build a complete registry and make it available to persons working in health fields, particularly to Comprehensive Health Planning agencies.

University of Colorado Medical Center

The University of Colorado Medical Center has notified the governors of seven regional states that it can no longer accept out-of-state patients with kidney failure for long-term treatment in its artificial kidney (hemodialysis) facilities.

The notifications have gone to the governors and health and welfare officials of Wyoming, Montana, North and South Dakota, Nebraska, Kansas and New Mexico.

Dr. Conger urged the governors and other state officials to locate other centers to which kidney failure patients in their states can be referred and to plan for financial assistance in obtaining treatment for them on a continuing basis. He offered the experience and expertise of the CU Medical Center in the training, at cost, of physicians, nurses and technologists from the other states to permit the establishment or expansion of their dialysis resources.

The CU Medical Center has operated an artificial kidney program for 17 years, and for a number of years was the only center in the western half of the United States with facilities and trained personnel for dialyzing kidney failure patients. It is today one of the leading centers in the nation for chronic dialysis treatment and the training of patients for home dialysis.

The mounting need and demand for continuing, long-term dialysis has created acute financial, patient-load and professional education problems for the Medical Center, Dr. Conger said. In 1964, the CU Center provided 430 dialysis treatments for patients; last year, the total treatments were 3,500.

University of Nevada School of Medicine

A grant of $37,500 has been made by the Reno Cancer Center to the School of Medical Sciences at the University of Nevada, Reno.

It is for five years at $7,500, starting this month. The grant of $7,500 a year is intended for partial support of a professorship that will enhance and provide instruction in areas of research that the Cancer Center has funded in the past and continues to sponsor.

A federal grant of $720,000 for construction of the first new building of the School of Medical Sciences at the University of Nevada, Reno, has been approved by the National Institute of Health. An additional $300,000 will come from the College of Agriculture, and $60,000 from W. K. Kellogg Foundation and Commonwealth Fund grants. None of the money for the $1,080,000 building will come from Nevada revenues, but is all to be provided by federal and private foundation grants.

Construction on the new building is to start in October this year, and is scheduled for completion by the fall of 1971 when the first class in the two-year medical curriculum begin their studies.

OBITUARIES

Utah

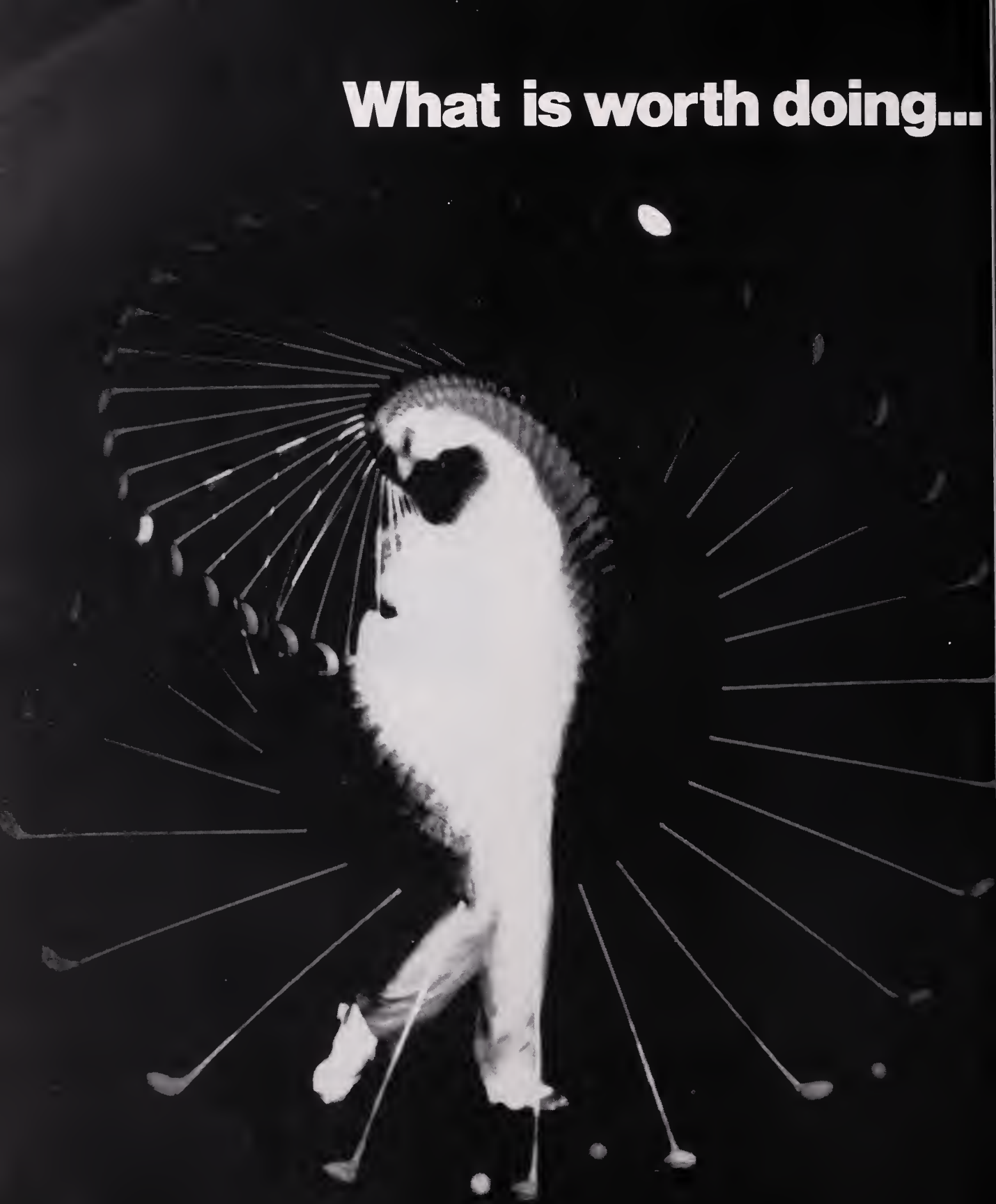
W. Rees Merrell, MD, USMA Trustee and longtime Brigham City physician, died August 2, 1970, in an Ogden hospital. He was 69.

Born April 22, 1901, in Brigham City, he was the son of Charles William and Mary Rees Merrell. He married Vera Preston in September of 1925. They were later divorced. He married Virginia Warburton in August 1954, in Brigham City.

Doctor Merrell attended pre-medical school at the University of Utah, and graduated in 1927 from Washington University Medical School, St. Louis, Missouri. He returned to Brigham City in 1931, where he practiced surgery and obstetrics until the time of his death. Active in Medical Society affairs, Doctor Merrell was serving his second term as USMA Trustee and Councilor from the Box Elder County Medical Society. He was also a past President of that Society, and had served as the Medical Advisor for the Selective Service System local board.

Survivors include his widow, Mrs. Virginia Merrell, who is serving this year as President of the Woman's Auxiliary to the Utah State Medical Association. Also surviving are four children, Mrs. Robert (Arlene) Hutchison, Logan; Preston Rees Merrell, Upland, Calif.; Stephen L. Mehler, Logan; and Mrs. John (Michele) Fahsbender, Provo. Other survivors include four grandchildren, three brothers, and two sisters.

What is worth doing...



In 1936 A. E. Smith, professional at Woolcombe, England, recorded the lowest golf score for an 18 hole course. He shot a 55 and was 15 under par. The course at Woolcombe, which measured 4,248 yards, was covered in 4, 2, 3, 4, 2, 4, 3, 4, 3 out and 2, 3, 3, 3, 3, 2, 5, 4, 1 in.

is worth doing well.

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Precautions: Use may result in overgrowth of nonsusceptible organisms. Constant observation is essential. If new infections appear, take appropriate measures. Use of tetracycline during teeth development may cause discoloration of teeth.
Side Effects: Gastrointestinal system—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. Skin—maculopapular and erythematous rashes (a case of exfoliative dermatitis has been reported); photosensitivity reaction, onycholysis and discoloration of nails (rare). Kidney—rise in BUN, apparently dose-related. Hypersensitivity reactions—urticaria, angioneurotic edema, anaphylaxis. In young infants, bulging fontanels have been reported following full therapeutic dosage. This symptom has disappeared rapidly when drug is discontinued. Teeth—dental staining (yellow-brown) in children of mothers given tetracycline during the latter half of pregnancy, and in children given the drug during the neonatal period, infancy and early childhood. Enamel hypoplasia has been seen in a few children. Blood—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. Liver—cholestasis (rare), usually at high dosage. Tetracycline may form a stable calcium complex in bone-forming tissue. If adverse reaction or idiosyncrasy occurs, discontinue medication and institute appropriate therapy.
Average Adult Daily Dosage: One Gm. per day, in 4 divided doses of 250 mg. each. Should be given 1 hour before or 2 hours after meals, since absorption is impaired by the concomitant administration of high calcium content drugs, foods and some dairy products. Treatment of streptococcal infections should continue for 10 days, even though symptoms have subsided.

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24th AMA Clinical Convention in Boston, Massachusetts November 29-December 2, 1970

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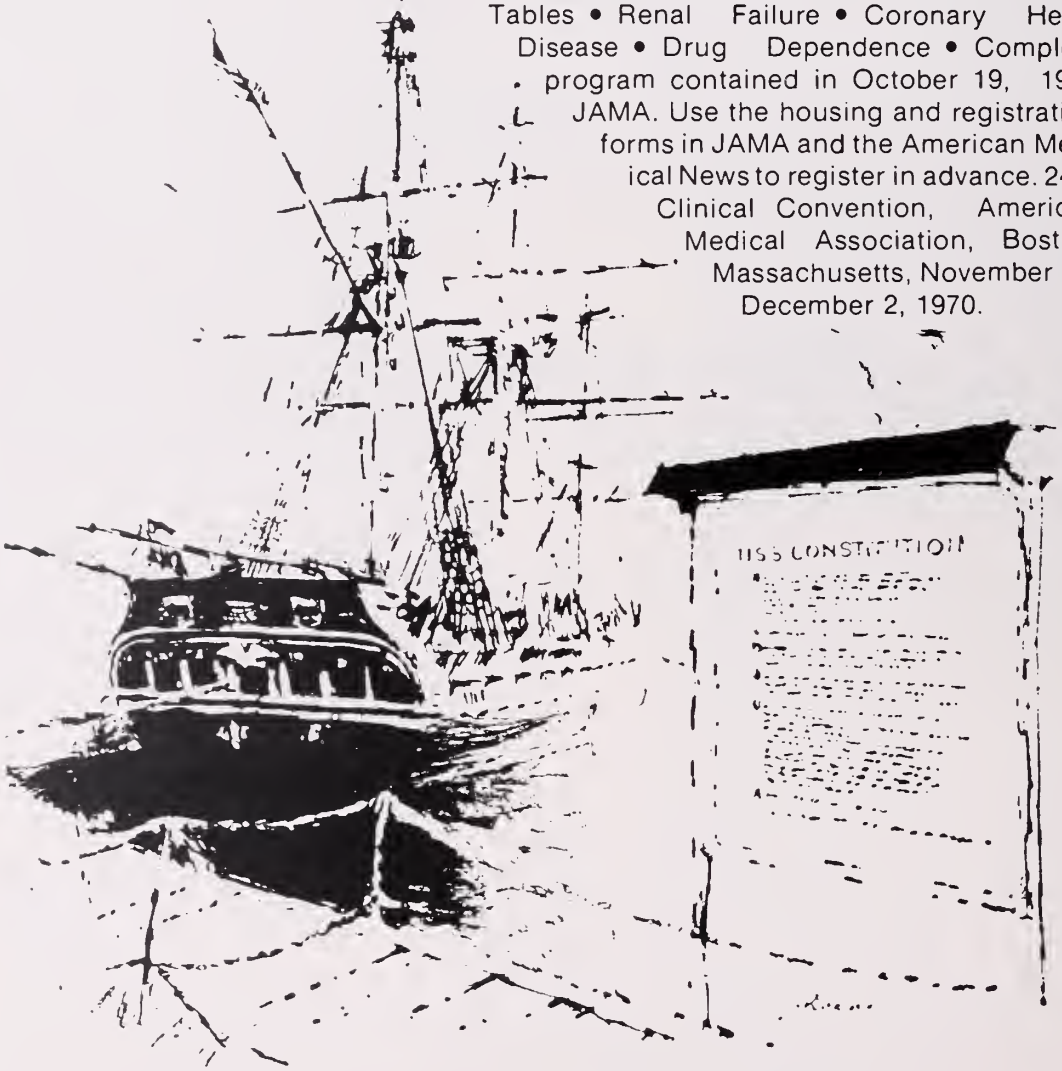

Publication rules and suggestions to authors

1. Who may submit articles. The Rocky Mountain Medical Journal ordinarily accepts only articles prepared by members of the state societies we serve and by guest speakers at their official meetings.

2. Method of preparation. All material for publication must be typewritten, double spaced, with liberal margins, using only one side of the paper, pages consecutively numbered, and preferably on standard 8½ x 11 white bond paper. Carbon copies are *not* acceptable.

Title (preferably short) and author's name, city and state must appear at the top of the first page. Second and subsequent pages should be identified with consecutive page numbers and author's surname. If physician authors possess more than one degree, the MD only is used. Lesser degrees of non-MD authors or co-authors may be used.

Please include beneath the title or at the top of the first page a brief paragraph stating what the article is designed to show and, therefore, why it should be read. This introductory feature is, in editorial parlance, called the "blurb"; it is printed in bold type.

3. Where to submit material. All copy must be sent to the editor for the state in which the material originates. Editors for each state, with their mailing addresses, are listed monthly on the Table of Contents page of the Journal.

4. Acceptance or rejection. The state editor will (1) tentatively accept the article, (2) return it to the author with suggestions for revision, or (3) reject it. He will edit and forward approved copy to the publication office in Denver for final editing and scheduling.

5. Order of publication. Ordinarily, articles will be published in the order received. Those whose value is seasonal, whose value would be lost if publication is delayed, or which reflect priority of original research, are given special consideration. State presidential addresses, programs, state society minutes, and timely organization announcements are given priority.

6. Length of articles. Scientific papers should be "boiled down" not to exceed ten pages of double-spaced typewritten standard 8½ x 11 inch sheets. Shorter papers are more acceptable to editors and readers, and earlier publication is probable. Every journal is in competition for the reader's time, and condensation is the order of the day. For this reason, and because of financial and space limitations, we request that copy be condensed to the greatest extent consistent with conveying the message.

7. Illustrations. A limited number of illustrations or "cuts," usually up to six, will ordinarily be accepted within our own publication budget if the editor believes they enhance the value of the article. Clear photos, simple diagrams or line drawings in black on white, printing rather than writing, reproduce well. Cuts should be mounted separately, and the paper or cardboard mounts should be the same size as that upon which the article is typed. Each should have its caption below: Fig. 1, Fig. 2, etc., with a short descriptive sentence. Authors will be billed our cost for excess above six cuts.

8. Tables. Tables should be simple, presenting only brief relevant data, amply spaced. They should be placed at the back of the manuscript on separate sheets. Each should have its number and title above: Table 1, Title; Table 2, Title; etc. Long, large, or complicated tables ordinarily are not acceptable.

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October 27, 1970
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For more information contact: Joseph L. Butterfield, M.D., Dept. of Continuing Education, Denver, Children's Hospital, 1056 E. 19th Ave., Denver, Colorado 80218.

17th Annual General Practice Review
Humphreys Postgraduate Center
University of Colorado
School of Medicine, Denver, Colorado
January 18-23, 1971
February 1-6, 1971

YMCA Conference Center
Estes Park, Colorado
June 21-26, 1971

Write: Office of Postgraduate Medical Education, University of Colorado School of Medicine, 4200 East 9th Avenue, Denver, Colorado 80220.

17th Western Cardiac Conference
What's New in Cardiology
University of Colorado Medical Center
Denison Auditorium
4200 East 9th Avenue, Denver, Colorado
October 21-23, 1970

For more information write: Colorado Heart Association, 1375 Delaware Street, Denver, Colorado 80204.

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Recent Acquisitions

Abdominal Trauma: By Meyer O. Cantor. Springfield, Ill., 1970, Thomas. 212 p. Price: Review.

Cardiovascular Clinics Series: Edited by Albert Brest. Philadelphia, 1969, Davis. 3 vols. Price: Not set.

Electron Microscopy: By E. H. Mercer and M. S. C. Birbeck. 2nd ed. Oxford, 1966, Blackwell. 102 p. Price :$2.25.

The Ileostomy Patient: By Edith Lenneberg and John L. Rowbotham. Springfield, Ill., 1970, Thomas. 208 p. Price: Review.

The Law and Clinical Medicine: By Elliott L. Sagall and Barry C. Reed. Philadelphia, 1970, Lippincott. 224 p. Price: Not set.

Orthopedic Clinics of North America, v. 1 No. 1: Edited by J. Paul Harvey, Jr. Philadelphia, 1970, Saunders. 195 p. Price: $22.50.

The Paranoid: By David W. Swanson and others. Boston, 1970, Little, Brown. 523 p. Price: $10.50.

Primer on Immunological Disorders: By Heinz J. Wittig and others. Springfield, Ill., 1970, Thomas. 123 p. Price: Review.

Reform of Medical Education: Edited by J. R. Krevans and P. Condliffe. Washington, D.C., 1970, National Academy of Sciences. 238 p. Price: Gift:

The Role of The Surgeon In Medical School Education: By Allen O. Whipple Surgical Society. Springfield, Ill., 1970, Thomas. 155 p. Price: Review.

Septic Complications of Neurosurgical Procedures: By R. Lewis Wright. Springfield, Ill., 1970, Thomas. 107 p. Price: Review.

Spectroscopic Approaches To Biomolecular Conformation: By D. W. Urry. Chicago, 1970, American Medical Association. 314 p. Price: Gift.

The Unique Legacy of Doctor Hughlings Jackson: By Arthur M. Lassek, Sr. Springfield, Ill., 1970, Thomas. 146 p. Price: Review.

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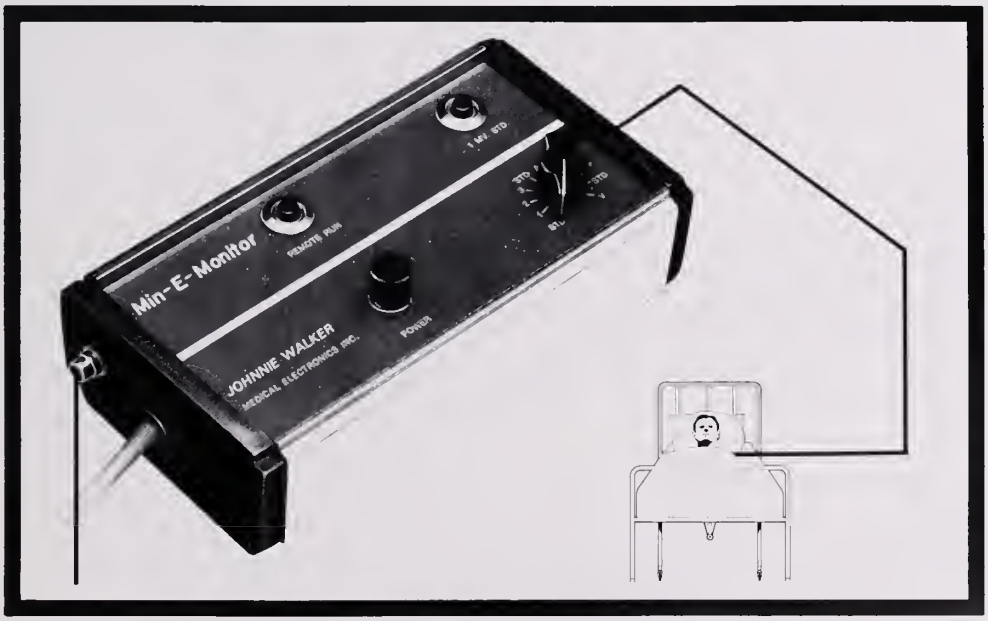

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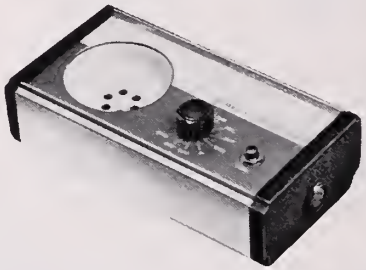

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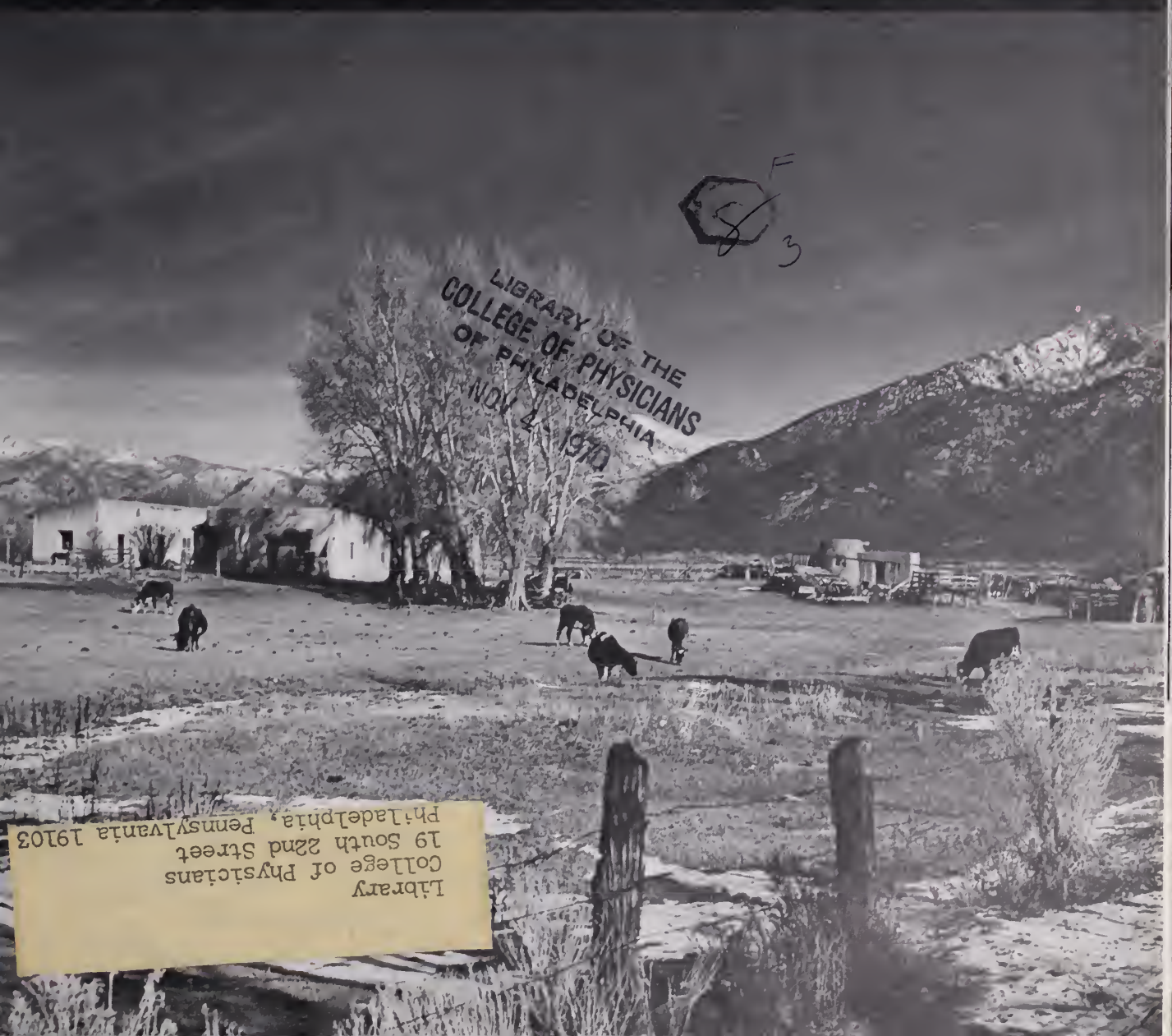

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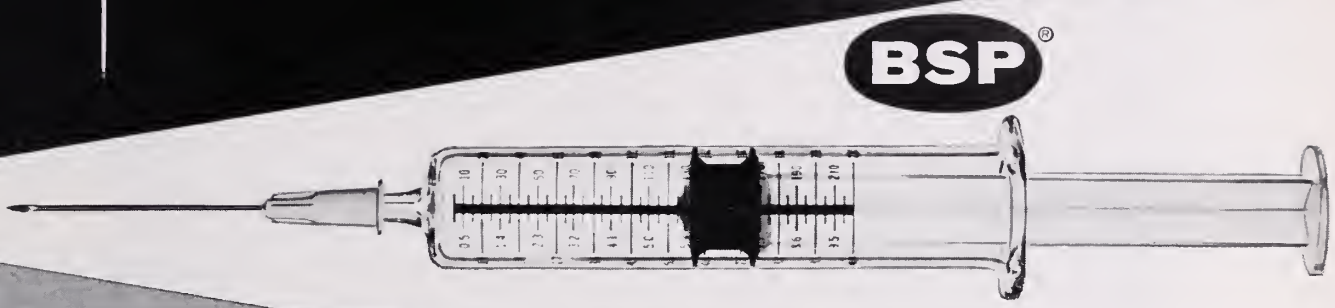

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OUR COVER PHOTO

A quiet ranch scene, north of Taos, New Mexico. The rugged Sangre de Cristo Mountains shelter many peaceful valleys on the high country of northern New Mexico.

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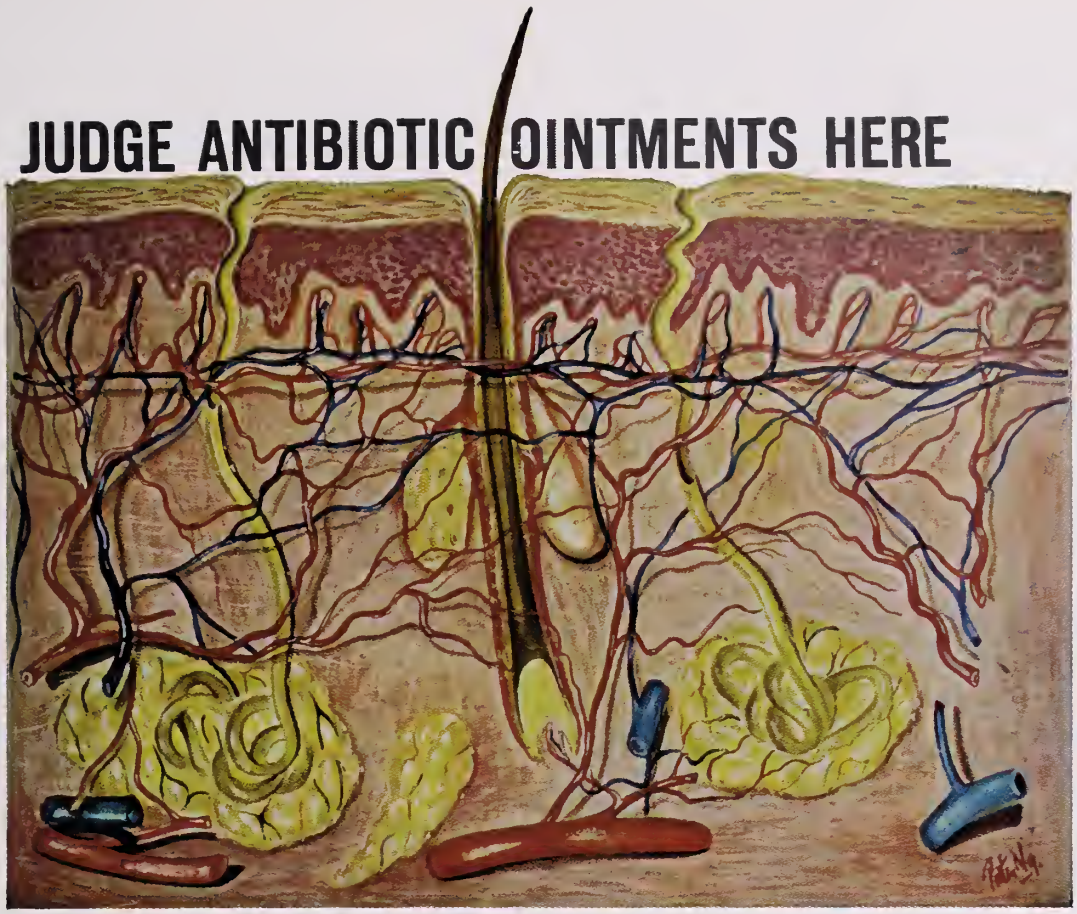

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I was very pleased to find in your April and May editions several articles and editorials addressed to such problems as population control, pollution, the environmental impact on health, and physicians' interactions with social processes. It is not difficult to see how the population explosion reverberates in the problems of our polluted social and physical environment. A sense of urgency has developed, especially in the scientific community, as we witness the snowballing effects of man's impact on the word ecology.

There is no question that physicians, as a group, have the scientific training, community status and responsibility to formulate, influence, and implement social change. On an immediate, practical basis, the medical profession is intimately related to current methods of population management such as conception control, sterilization, and abortion procedures. But we must do more. Time is *not* on our side. Dr. Bowman's editorial in the May issue outlined current efforts at population control and contained a call for "personal action." We invite your comments, questions, and support.

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For upper respiratory allergies and infections, up to 12 hours clear breathing on one tablet. Dimetapp Extentabs® does an outstanding job of helping to clear up the stuffiness, drip and congestion of colds and upper respiratory allergies and infections. Each Extentab keeps working up to 12 hours. And for most patients drowsiness or overstimulation is unlikely.

INDICATIONS: Dimetapp is indicated for symptomatic relief of the allergic manifestations of respiratory illnesses, such as the common cold and bronchial asthma, seasonal allergies, rhinitis, conjunctivitis, and otitis. CONTRAINDICATIONS: Hypersensitivity to antihistamines. Not recommended for use during pregnancy. PRECAUTIONS: Until patient's response has been determined, he should be cautioned against engaging in operations requiring alertness. Administer with care to patients with cardiac or peripheral vascular diseases or hypertension. SIDE EFFECTS: Hypersensitivity reactions including skin rashes, urticaria, hypotension and thrombocytopenia, have been reported on rare occasions. Drowsiness, lassitude, nausea, giddiness, dryness of the mouth, mydriasis, increased irritability or excitement may be encountered. DOSAGE: 1 Extentab morning and evening. SUPPLIED: Bottles of 100 and 500.

A·H·ROBINS

A. H. Robins Company
Richmond, Va. 23220

Dimetapp® Extentabs

Dimetane® (brompheniramine maleate), 12 mg.; phenylephrine HCl, 15 mg.; phenylpropanolamine HCl, 15 mg.

in cardiac edema

Dyazide®

Trademark

Each capsule contains 50 mg. of Dyrenium® (brand of triamterene) and 25 mg. of hydrochlorothiazide.

gets the water out

spares the potassium

Before prescribing, see complete prescribing information in SK&F literature or *PDR*.

Indications: Edema associated with congestive heart failure, cirrhosis of the liver, the nephrotic syndrome, late pregnancy; also steroid-induced and idiopathic edema, and edema resistant to other diuretic therapy. 'Dyazide' is also indicated in the treatment of mild to moderate hypertension.

Contraindications: Pre-existing elevated serum potassium. Hypersensitivity to either component. Continued use in progressive renal or hepatic dysfunction or developing hyperkalemia.

Warnings: **Do not use dietary potassium supplements or potassium salts unless hypokalemia develops or dietary potassium intake is markedly impaired.** Enteric-coated potassium salts may cause small bowel stenosis with or without ulceration. Hyperkalemia (>5.4 mEq/L) has been reported in 4% of patients under 60 years, in 12% of patients over 60 years, and in less than 8% of patients overall. Rarely, cases have been associated with cardiac irregularities. Accordingly, **check serum potassium during therapy, particularly in patients with suspected or confirmed renal insufficiency (e.g., certain elderly or diabetics). If hyperkalemia develops, substitute a thiazide alone. If spironolactone is used concomitantly with 'Dyazide', check serum potassium frequently**—they can both cause potassium retention and sometimes hyperkalemia. Two deaths have been reported in patients on such combined therapy (in one, recommended dosage was exceeded; in the other, serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage or other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium (triamterene, SK&F). Rarely, leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with the thiazides. Watch for signs of impending coma in acutely ill cirrhotics. Thiazides are reported to cross the placental barrier and appear in breast milk. This may result in fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and possibly other adverse reactions that have occurred in the adult. When used during pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus.

Precautions: Do periodic serum electrolyte and BUN determinations. Do periodic hematologic studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in postsympathectomy patients. The following may occur: hyperuricemia and gout, reversible nitrogen retention, decreasing alkali reserve with possible metabolic acidosis, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), digitalis intoxication (in hypokalemia). Use cautiously in surgical patients. Concomitant use with antihypertensive agents may result in an additive hypotensive effect.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis; rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting (may indicate electrolyte imbalance), diarrhea, constipation, other gastrointestinal disturbances. Rarely, necrotizing vasculitis, paresthesias, icterus, pancreatitis, and xanthopsia have occurred with thiazides alone.

Supplied: Bottles of 100 capsules.

SK&F

Smith Kline & French Laboratories

Louie's back on the track! After an arthritic flare-up.

They laughed about Louie's "lumbago". But it wasn't lumbago.

He lost weeks with an attack of aspirin-stubborn rheumatoid spondylitis...weeks of inflammatory pain and stiffness.

"The early symptoms of ankylosing spondylitis are frequently mislabelled as muscular rheumatism, fibrositis, lumbago, chronic low back strain, idiopathic sciatica or even kidney disease." *

"In a few (patients), disabling attacks often described as 'lumbago' occur." *

In patients with clinically confirmed aspirin-stubborn spondylitis, consider Butazolidin alka:
Prompt anti-inflammatory action
Short trial period
Low maintenance dosage

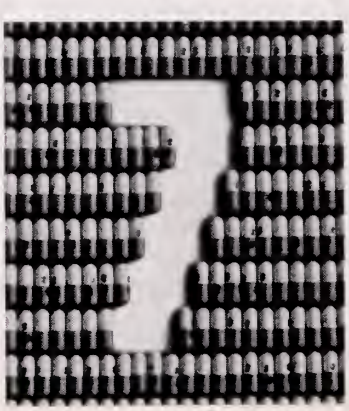
Butazolidin® alka

100 mg. phenylbutazone
100 mg. dried aluminum hydroxide gel
150 mg. magnesium trisilicate

Serious side effects can occur. Select patients carefully (particularly the elderly) and follow them closely in line with the drug's precautions, warnings and contraindications. Read the prescribing information. It's summarized below.

If it doesn't work in a week, forget it.

* Boland, Edward W.: Ankylosing Spondylitis, in *ARTHRITIS*, ed. 7, edited by J. L. Hollander (section edited by C. McEwen), Philadelphia, Lea & Febiger, 1966, chap. 39, p. 639.



Indications: Osteoarthritis, rheumatoid arthritis, rheumatoid spondylitis, psoriatic arthritis, acute gout, painful shoulder (peritendinitis, capsulitis, bursitis and acute arthritis of that joint), acute superficial thrombophlebitis.

Contraindications: Edema, danger of cardiac decompensation; history or symptoms of peptic ulcer; renal, hepatic or cardiac damage; history of drug allergy; history of blood dyscrasia. The drug should not be given when the patient is senile or when other potent drugs are given concurrently. Large doses of the alka formulation are contraindicated in glaucoma.

Warning: If coumarin-type anticoagulants are given simultaneously, watch for excessive increase in prothrombin time. Instances of severe bleeding have occurred. Persistent or severe dyspepsia may indicate peptic ulcer; perform upper gastrointestinal x-ray diagnostic tests if drug is continued. Pyrazole compounds may potentiate the pharmacologic action of sulfonylurea, sulfonamide-type agents and insulin. Carefully observe patients receiving such therapy. Use with caution in the first trimester of pregnancy and in patients with thyroid disease.

Precautions: Before prescribing, carefully select patients, avoiding those responsive to routine measures as well as contraindicated patients. Obtain a detailed history and a complete physical and laboratory examination, including a blood count. Patients should not exceed recommended dosage, should be closely supervised and should be warned to discontinue the drug and report immediately if fever, sore throat or mouth lesions (symptoms of blood dyscrasia); sudden weight gain (water retention); skin reactions; black or tarry stools or other evidence of intestinal hemorrhage occur. Make complete blood counts at weekly intervals during

)to: posed by professional model at
e Hollow Stud Farm, Pine Bush, N.Y.
horse in the picture is Romeo
lover, a world champion pacer.

ly therapy and at 2-week intervals
reafter. Discontinue the drug imme-
tely and institute countermeasures
ne white count changes significantly,
inulocytes decrease, or immature
ms appear. Use greater care in the
erly and in hypertensives.
Adverse Reactions: The more com-
n are nausea and edema. Swelling of
ankles or face may be minimized by
hholding dietary salt, reduction in
sage or use of diuretics. In elderly
ients and in those with hypertension
drug should be discontinued with
appearance of edema. The drug has
en associated with peptic ulcer and
y reactivate a latent peptic ulcer.
e patient should be instructed to take doses immediately before or after meals or with milk to minimize gastric upset. Drug rash occasionally occurs. If it does, promptly discontinue the drug. Agranulocytosis, exfoliative dermatitis, Stevens-Johnson syndrome, Lyell's syndrome (toxic necrotizing epidermolysis), or a generalized allergic reaction similar to serum sickness may occur and require permanent withdrawal of medication. Agranulocytosis can occur suddenly in spite of regular, repeated normal white counts. Stomatitis and, rarely, salivary gland enlargement may require cessation of treatment. Such patients should not receive subsequent courses of the drug. Vomiting, vertigo and languor may occur. Leukemia and leukemoid reactions have been reported. While not definitely attributable to the drug, a causal relationship cannot be excluded. Thrombocytopenic purpura and aplastic anemia may occur. Confusional states, agitation, headache, blurred vision, optic neuritis and transient hearing loss have been reported, as have hyperglycemia, hepatitis, jaundice, hypersensitivity angiitis, pericarditis and several cases of anuria, glomerulonephritis and hematuria. With long-term use, reversible thyroid hyperplasia may occur infrequently. Moderate lowering of the red cell count due to hemodilution may occur.

Dosage in Rheumatoid Spondylitis: Initial: 3 to 6 capsules daily in 3 or 4 equal doses. Trial period: 1 week. Maintenance dosage should not exceed 4 capsules daily; response is often achieved with 1 or 2 capsules daily. In selecting the appropriate dosage in any specific case, consideration should be given to the patient's weight, general health, age and any other factors influencing drug response. (B)46-070-C

For complete details, please see full prescribing information.

Geigy Pharmaceuticals
Division of Geigy Chemical Corporation
Ardsley, New York 10502

BU-7281

Roche announces

Efudex®

(fluorouracil) cream/solution

for the treatment of solar/actinic keratoses... a topical alternative to conventional therapy

1/22/68—Treatment with 5% 5-FU cream commences. Patient K.L. showing widespread but mild solar keratoses (also known as actinic keratoses).

Fluorouracil—the Roche contribution

In 1962, Roche Laboratories introduced Fluorouracil Roche® (5-fluorouracil). Early clinical work with this drug suggested that it possessed a selective cytotoxic activity when applied topically to certain kinds of lesions. Based on this work and years of clinical trials, a standardized form of topical fluorouracil can now be recommended for treatment of multiple solar or actinic keratoses.

Efudex®(fluorouracil)—a new alternative to conventional therapy

Efudex presents the physician with a topical alternative to surgery in the treatment of solar or actinic keratoses. It is effective, comparatively inexpensive and especially well-suited for treatment of multiple lesions. Important, too, is the highly desirable cosmetic result. Clinical experience demonstrates that treatment with Efudex results in an extremely low incidence of scarring.*

Highly effective on first and later applications

In clinical trials, depending on the dosage form and strength used, complete involution occurred in 77 to 88 per cent of lesions following treatment. The rate of recurrence was low, ranging from 1.7 to 5.6 per cent up to a year after completion of therapy. When lesions did recur or new ones appeared, repeated courses of Efudex therapy proved effective.*

2/2/68—After 11 days of treatment. Erythema is seen at site of keratoses. In addition, numerous lesions not apparent prior to therapy have become manifest by sharply defined reactions. Intervening skin, also treated, shows no response to therapy.

2/19/69—One year after cessation of therapy. Skin appears clear with no evidence of scarring. Examination reveals lack of recurrence or the formation of new lesions.

Predictable sequence of therapeutic response

Two to four weeks constitutes a typical course of Efudex therapy. The response is usually characteristic and predictable. After three or four days of treatment, erythema begins to appear in the area of the keratoses. This is followed by an intense inflammatory response, scaling and occasionally moderate tenderness or pain. The height of the inflammatory reaction generally occurs two weeks after the start of therapy, and then begins to subside as treatment is stopped. Within two weeks of discontinuing medication, the inflammation is usually gone. A mild erythema may remain for two to three months before gradually receding.

Selective—with a high degree of safety

Despite the temporary unsightliness and discomfort of the inflammatory episode, Efudex is, in general, more readily tolerated than surgery. Clinical work shows the intense inflammatory response to be limited to the area of the lesion. Normal skin is not similarly affected. Another measure of Efudex safety: systemic absorption of topical fluorouracil was insignificant, indicating a low risk of systemic toxicity.*

Two strengths—two convenient dosage forms

Efudex is available as a 2% or 5% solution or as a 5% cream. It is applied twice daily by the patient with a nonmetal applicator or suitable glove.

Before prescribing Efudex, however, there are two important considerations. First, please consult the complete prescribing information for precautions, warnings and adverse reactions. Second, advise the patient that treated lesions should respond with the characteristic but transient inflammation. A positive sign that Efudex is working for them.

*Data on file, Hoffmann-La Roche Inc., Nutley, New Jersey.

2% and 5% Solutions; 5% Cream Applied twice daily—resolves solar or actinic keratoses.

new Efudex® (fluorouracil) cream/solution

For full prescribing information, please see the following page.

Roche introduces

Efudex®

(fluorouracil) cream/solution the new standardized topical for solar/actinic keratoses

Description: Efudex solutions and cream are topical preparations containing the fluorinated pyrimidine 5-fluorouracil, an antineoplastic antimetabolite.

Efudex Solution consists of 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris-(hydroxymethyl) aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream contains 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

Actions: There is evidence that the metabolism of fluorouracil in the anabolic pathway blocks the methylation reaction of deoxyuridylic acid to thymidylic acid. In this fashion fluorouracil interferes with the synthesis of deoxyribonucleic acid (DNA) and to a lesser extent inhibits the formation of ribonucleic acid (RNA). Since DNA and RNA are essential for cell division and growth, the effect of fluorouracil may be to create a thymine deficiency which provokes unbalanced growth and death of the cell. The effects of DNA and RNA deprivation are most marked on those cells which grow more rapidly and which take up fluorouracil at a more rapid pace. The catabolic metabolism of fluorouracil results in degradative products (*e.g.*, CO_2, urea, α-fluoro-β-alanine) which are inactive.

Studies in man with topical application of ^{14}C-labeled Efudex demonstrated insignificant absorption as measured by ^{14}C content of plasma, urine and respiratory CO_2.

Indications: Efudex is recommended for the topical treatment of multiple actinic or solar keratoses.

Contraindications: Efudex is contraindicated in patients with known hypersensitivity to any of its components.

Warnings: If an occlusive dressing is used, there may be an increase in the incidence of inflammatory reactions in the adjacent normal skin.

Prolonged exposure to ultraviolet rays should be avoided while under treatment with Efudex because the intensity of the reaction may be increased.

Usage in Pregnancy: Safety for use in pregnancy has not been established.

Precautions: If Efudex is applied with the fingers, the hands should be washed immediately afterward. Efudex should be applied with care near the eyes, nose and mouth. To rule out the presence of a frank neoplasm, a biopsy should be made of those areas failing to respond to treatment or recurring after treatment.

Adverse Reactions: The most frequently encountered local reactions were pain, pruritus, hyperpigmentation and burning at the site of application. Other local reactions included dermatitis, scarring, soreness and tenderness.

Also reported were insomnia, stomatitis, suppuration, scaling, swelling, irritability, medicinal taste, photosensitivity and lacrimation.

Laboratory abnormalities reported were leukocytosis, thrombocytopenia, toxic granulation and eosinophilia.

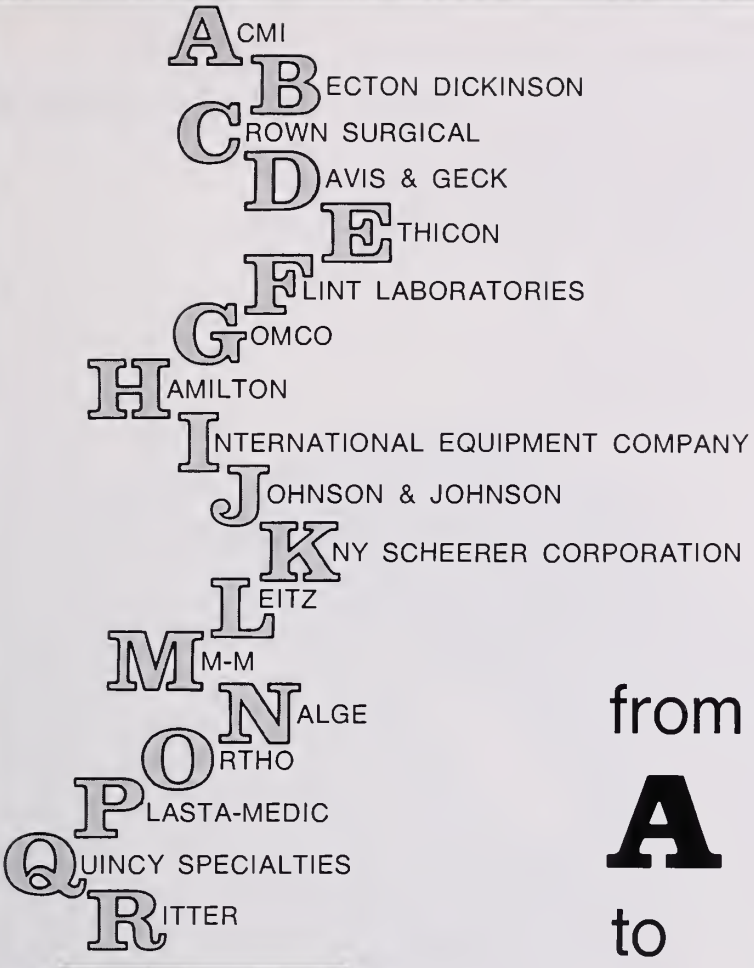
Dosage and Administration: Efudex should be applied twice daily with a nonmetal applicator or suitable glove in an amount of the solution or cream sufficient to cover the lesion. When Efudex is applied to a lesion, a response occurs with the following sequence: erythema, usually followed by vesiculation, erosion, ulceration, necrosis and epithelization. The lower frequency and intensity of activity in adjacent normal skin indicate a selective cytotoxic property. Medication should be continued until the inflammatory reaction reaches the erosion, necrosis and ulceration stage, at which time use of the drug should be terminated. The usual duration of therapy is from 2 to 4 weeks. Complete healing of the lesion may not be evident for 1 to 2 months following cessation of Efudex therapy.

How Supplied: Efudex Solution, 10-ml drop dispensers—containing 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris(hydroxymethyl)aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream, 25-Gm tubes—containing 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

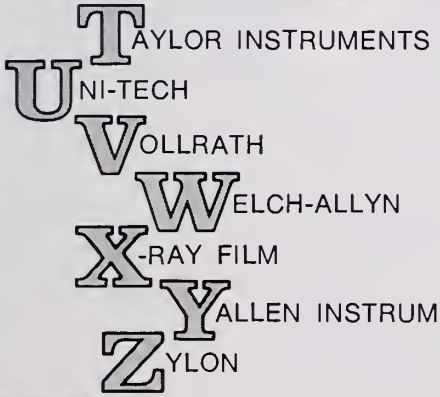
Clinical Studies: The effectiveness of the three preparations as determined by complete involution of solar keratoses was: 2% Solution, 77% of 282 lesions; 5% Solution, 88% of 202 lesions; and 5% Cream, 85% of 189 lesions. In those lesions where complete involution followed treatment, the rate of possible recurrences observed clinically at periods up to 12 months or more was: 2% Solution, 4.6% of 218 lesions; 5% Solution, 1.7% of 177 lesions; and 5% Cream, 5.6% of 160 lesions. Because of the toxic potential of fluorouracil, some physicians preferred to use the 2% solution when large areas were to be treated. Approximately 30% of the lesions required treatment for two weeks or less; approximately 78% required four weeks or less for adequate treatment.

ROCHE Roche LABORATORIES
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110



from **A** to **Z**...

Scherer* delivers!



The Rockies' newest house. *The* items. *More* sizes. SCHERER is your largest single source for the most respected names in Medical and Scientific manufacturing.

SCHERER is long on speed, service, stock; short on "sorry" or "lemme' see." Now serving *all* of the Rocky Mountain area—and proud to be!

Be sure. Call SCHERER.

*Formerly Rocky Mountain Surgical Supply of Colorado

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A Bergen Brunswig Company

BREAKUP—symbol of the impact of emotional stress. But when the stress exceeds transient rage or depression—and settles into a chronic mixed anxiety depression state—combined tranquilizer-antidepressant therapy could be indicated.

FOR MODERATE TO SEVERE ANXIETY WITH COEXISTING DEPRESSION

TRIAVIL®

TRANQUILIZER-ANTIDEPRESSANT

Containing perphenazine and amitriptyline HCl

For prescribing information, including indications, contraindications, warnings, precautions, and side effects, please see following page.

FOR MODERATE TO SEVERE ANXIETY WITH COEXISTING DEPRESSION

TRIAVIL®

TRANQUILIZER-ANTIDEPRESSANT

Containing perphenazine and amitriptyline HCl

TRIAVIL®2-10: Each tablet contains 2 mg. of perphenazine and 10 mg. of amitriptyline hydrochloride.

TRIAVIL®2-25: Each tablet contains 2 mg. of perphenazine and 25 mg. of amitriptyline hydrochloride.

TRIAVIL®4-10: Each tablet contains 4 mg. of perphenazine and 10 mg. of amitriptyline hydrochloride.

TRIAVIL®4-25: Each tablet contains 4 mg. of perphenazine and 25 mg. of amitriptyline hydrochloride.

INDICATIONS: Patients with moderate to severe anxiety and/or agitation and depressed mood; patients with depression in whom anxiety and/or agitation are severe; patients with depression and anxiety in association with chronic physical disease; schizophrenics with associated depressive symptoms.

CONTRAINDICATIONS: Central nervous system depression from drugs (barbiturates, alcohol, narcotics, analgesics, antihistamines); bone marrow depression; pregnancy; and in patients with known hypersensitivity to phenothiazines or amitriptyline. Do not give in combination with MAOI drugs because of possible potentiation that may even cause death. Allow at least two weeks between therapies. In such patients therapy with TRIAVIL should be initiated cautiously, with gradual increase in the dosage required to obtain a satisfactory response. Do not give concomitantly with guanethidine or similarly acting compounds since it may block the antihypertensive effect.

WARNINGS: Patients should be warned against driving a car or operating machinery or apparatus requiring alert attention, and that response to alcohol may be increased.

PRECAUTIONS: Suicide is always a possibility in mental depression and may remain until significant remission occurs. Supervise patients closely in case they may require hospitalization or concomitant electroshock therapy. Untoward reactions have been reported after the combined use of antidepressant agents having various modes of activity. Accordingly, consider possibility of potentiation in combined use of antidepressants. Use with caution in patients with glaucoma and those with problems of urinary retention. Perphenazine can lower the convulsive threshold in susceptible individuals. It should be given with caution to patients with convulsive disorders. Dosage of the anticonvulsive agent may have to be increased. Not recommended for use in children. Mania or hypomania may be precipitated in manic-depressives (perphenazine in TRIAVIL seems to reduce likelihood of this effect). If hypotension develops, epinephrine should not be employed, as its action is blocked and partially reversed by perphenazine. Caution patients about errors of judgment due to change in mood.

ADVERSE REACTIONS: Similar to those reported with either constituent alone.

Perphenazine: Should not be used indiscriminately. Use caution in patients who have previously exhibited severe reactions to other phenothiazines. Likelihood of untoward actions greater with high doses. Closely supervise with any dosage. Side effects may be any of those reported with phenothiazine drugs: extrapyramidal symptoms (opisthotonos, oculogyric crisis, hyperreflexia, dystonia, akathisia, dyskinesia, parkinsonism) usually controlled by the concomitant use of effective antiparkinsonian drugs and/or by reduction in dosage, but sometimes persist after discontinuation of the phenothiazine; skin disorders (photosensitivity, itching, erythema, urticaria, eczema, up to exfoliative dermatitis); other allergic reactions (asthma, laryngeal edema, angioneurotic edema, anaphylactoid reactions); peripheral edema; reversed epinephrine effect; hyperglycemia; endocrine disturbances (lactation, galactorrhea, disturbances of menstrual cycle); altered cerebrospinal fluid proteins; paradoxical excitement; EKG abnormalities (quinidine-like effect); reactivation of psychotic processes; catatonic-like states; autonomic reactions, such as dryness of the mouth, headache, nausea, vomiting, constipation, obstipation, urinary frequency, blurred vision, nasal congestion, and a change in the pulse rate; hypnotic effects; pigmentary retinopathy; corneal and lenticular pigmentation; occasional lassitude; muscle weakness; mild insomnia. Other adverse reactions reported with various phenothiazine compounds, but not with perphenazine, include blood dyscrasias (pancytopenia, thrombocytopenic purpura, leukopenia, agranulocytosis, eosinophilia); liver damage (jaundice, biliary stasis); grand mal convulsions; cerebral edema; polyphagia; photophobia; skin pigmentation; and failure of ejaculation. Significant unexplained rise in body temperature may suggest intolerance to perphenazine, in which case discontinue. Antiemetic effect may obscure signs of toxicity due to overdosage of other drugs or make diagnosis of other disorders such as brain tumors or intestinal obstruction difficult. May potentiate the action of central nervous system depressants (opiates, analgesics, antihistamines, barbiturates, alcohol) and atropine. In concurrent therapy with any of these, TRIAVIL should be given in reduced dosage. May also potentiate the action of heat and phosphorous insecticides.

Amitriptyline: Careful observation of all patients recommended. Side effects include drowsiness (may occur within the first few days of therapy); dizziness; nausea; excitement; hypertension; fainting; fine tremor; jitteriness; weakness; headache; heartburn; anorexia; increased perspiration; incoordination; impotence; increased appetite and weight gain; allergic-type reactions manifested by skin rash, swelling of face and tongue, itching; numbness and tingling of limbs, including peripheral neuropathy; activation of latent schizophrenia (however, the perphenazine content may prevent this reaction in some cases); epileptiform seizures; temporary confusion, disturbed concentration, or transient visual hallucinations on high doses; evidence of anticholinergic activity, such as tachycardia, dryness of mouth, stomatitis, blurring of vision, reversible dilatation of the urinary tract, urinary retention, constipation, paralytic ileus; agranulocytosis; jaundice. Elderly patients and adolescents can often be managed on lower dosage levels.

For more detailed information, consult your MSD Representative or see the package circular. Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa. 19486.

MSD MERCK SHARP & DOHME

A
BUILDING BLOCK
TO RECOVERY

"Welcome back, Ann"
As adjunctive therapy
DOUBLE STRENGTH
Orenzyme®
Bitabs One tablet q.i.d.
Trypsin 100 000 N.F. Units, Chymotrypsin: 8,000 N.F. Units; equivalent in tryptic activity to 40 mg. of N.F. trypsin
Reduces swelling
Hastens healing
Speeds recovery
trauma
One tablet q.i.d.
Indications: When used as adjunctive therapy for the rapid resolution of inflammation and edema, good results have been obtained in:
□ Accidental Trauma □ Postoperative Tissue Reactions.
Other conventional measures of treatment should be used as indicated. In infection, appropriate anti-infective therapy should be given.
Contraindications: ORENZYME BITABS should not be given to patients with a known sensitivity to trypsin or chymotrypsin.
Precautions: It should be used with caution in patients with abnormality of the blood clotting mechanism such as hemophilia, or with severe hepatic or renal disease. Safe use in pregnancy has not been established.
Adverse Reactions: Adverse reactions with ORENZYME have been reported infrequently. Reports include allergic manifestations (rash, urticaria, itching), gastrointestinal upset and increased speed of dissolution of animal-origin surgical sutures. There have been isolated reports of anaphylactic shock, albuminuria and hematuria. Increased tendency to bleed has also been reported but, in controlled studies, it has been seen with equal incidence in placebo-treated groups. (See Precautions.) It is recommended that if side effects occur medication be discontinued.
Dosage: One tablet q.i.d.
THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144
TRADEMARK BITABS U.S. PATENT NO. 3,004,893 9/70 0-009A 161

Orenzyme® Bitabs

Trypsin: 100,000 N.F. Units, Chymotrypsin: 8,000 N.F. Units; equivalent in tryptic activity to 40 mg. of N.F. trypsin

The causes of vaginitis are multiple

Trichomonads... monilia... bacteria
You can depend on AVC—comprehensive therapy that combats all three major vaginal pathogens, alone or in combination.

AVC
Cream (aminacrine hydrachlaride 0.2%, sulfanilamide 15.0%, allantoin 2.0%)

Suppositories (aminacrine hydrachloride 0.014 Gm., sulfanilamide 1.05 Gm., allantain 0.14 Gm.)

Contraindications: Known sensitivity to sulfonamides.
Precautions/Adverse Reactions: The usual precautions for topical and systemic sulfanamides should be observed because of the possibility of absorption. Burning, increased local discomfort, skin rash, urticaria ar ather manifestations of sulfonamide toxicity are reasons to discontinue treatment.
Dosage: One applicatorful or one suppository intravaginally once or twice daily.
Supplied: Cream – Four-ounce tube with or without applicator. Suppositories – Box of 12 with applicator.

TRADEMARK: AVC AV-007A 7/70 Y-149

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON MERRELL INC
PHILADELPHIA, PENNSYLVANIA 19144

AVC
The treatment is singular

Equipped for the thyroid emergency?

When an ambulance arrives with the unexpected patient presenting the classical picture of myxedema coma, is your hospital suitably equipped? It is if SYNTHROID® (sodium levothyroxine) injectable is at hand. You are also ready to conveniently handle post-operative thyroid medication situations until oral therapy can be reinstated.

In tablet form this single entity synthetic thyroid provides smooth, predictable response for thyroid replacement. An excellent drug for long-term therapy.

But in an emergency, when rapid replacement is needed to sustain life, prompt clinical response is essential. SYNTHROID injection makes this therapy instantly available. Is it available in your hospital?

Levothyroxine has a high binding capacity for serum proteins in contrast to other thyroid medicaments that may contain a thyroactive agent with low binding capacity. *The baund levothyraxine is tatally measurable using the serum PBI test. It is not unusual ta find PBI levels af 8-10 mcg. per 100 ml. af serum.*

INDICATIONS: SYNTHROID (sodium levothyroxine) INJECTION is specific replacement therapy for diminished or absent thyroid function resulting from primary or secondary atrophy of the gland, congenital defect, surgery, excessive radiation, or antithyroid drugs. It is indicated in myxedematous coma and other thyroid dysfunctions where rapid replacement of the hormone is required. When a patient does not respond to oral therapy, SYNTHROID (sodium levothyroxine) INJECTION may be administered intravenously.

PRECAUTIONS: As with other thyroid preparations, overdose may cause diarrhea or cramps, nervousness, tremors, tachycardia, insomnia and continued weight loss. These effects may become apparent in from 4 days to three weeks. Therefore, patients should be kept under close observation. Medication, in such cases, should be stopped for 2 to 6 days, then resumed at a lower level. In patients with diabetes mellitus, look for possible changes in metabolic activity which may affect insulin or other antidiabetic drug dosage requirements.

CONTRAINDICATIONS: Thyrotoxicosis, ocute myocardial infarction.

SIDE EFFECTS: Side effects are secondary to increased rates of body metabolism: sweating, heart palpitations with or without pain, leg cramps, weight loss, diarrhea, vomiting and nervousness. Myxedematous patients with heart disease have died from abrupt increases in dosage of thyroid drugs. In most cases, a reduction in dosage followed by a more gradual adjustment upward will indicate the patient's dosage requirements without the appearance of side effects.

DOSAGE AND ADMINISTRATION: In myxedematous stupor or como, with no evidence of severe heart disease, 200 to 400 mcg. of SYNTHROID (sodium levothyroxine) INJECTION may be administered intravenously utilizing a solution containing 100 mcg. per ml. Detectable effects are usually observed by the sixth hour after injection and are fully appreciated during the following day. A repeat injection of 100 to 200 mcg. may be given on the second day if significant improvement has not occurred. The intravenous use of sodium levothyroxine in myxedematous coma is advantageous becouse it produces a predictable increase in the concentration of protein-bound iodine, eliminates the need for multiple doses until oral therapy is reinstated, circumvents the uncertainty of oral absorption, and avoids the risk of pulmonary aspiration.

SUPPLIED: SYNTHROID (sodium levothyroxine) INJECTION is supplied in 10 ml. vials containing 500 mcg. of lyophilized active ingredient and 10 mg. of Mannitol, N.F.; a 5 ml. vial containing Sodium Chloride Injection, U.S.P. is provided as diluent.

Also supplied as SYNTHROID (sodium levothyroxine) TABLET in color coded compressed tablets, and in seven strengths: 0.025 mg. (orange), 0.05 mg. (white), 0.1 mg. (yellow), 0.15 mg. (violet), 0.2 mg. (pink), 0.3 mg. (green), and 0.5 mg. (blue). Each strength is supplied in bottles of 100 and 500 tablets.

Synthroid®
(sodium levothyroxine, FLINT)
Injection

FLINT LABORATORIES
DIVISION OF TRAVENOL LABORATORIES, INC.
Morton Grove, Illinois 60053

Menrium® treats the menopausal symptoms that bother him most.

Roche
LABORATORIES
Division of Hoffmann-La Roche Inc
Nutley, New Jersey 07110

His wife has a lot of different menopausal symptoms, but only a few really irritate *him*. Her hot flashes, her vertigo, her palpitations—that's *her* problem. What really bothers him is her nervousness, her irritability and her excessive anxiety, often expressed by endless "book-shuffling, chain-smoking, reading-lamp" insomnia!

Menrium takes care of hot flashes, vertigo, palpitations in most menopausal women. Menrium provides the well-known antianxiety action of chlordiazepoxide (Librium®) and water-soluble esterified estrogens. It therefore relieves more symptoms than either component separately. It takes care of the vasomotor symptoms as well as the emotional symptoms. This means the symptoms that bother his wife most. And the symptoms that irritate him most.

So, to help them both get through *her* menopause, remember Menrium.

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Management of manifestations generally associated with the menopausal syndrome—anxiety and tension, vasomotor complaints and hormonal deficiency states.

Contraindications: Women with cancer of breast or genitalia, except inoperable cases, and those with known hypersensitivity to chlordiazepoxide and/or esterified estrogens.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. As with all CNS-acting drugs, caution patients against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Exclude other possible causes of menopausal syndrome manifestations, such as pregnancy. Though physical and psychological dependence have rarely been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) similar to those seen with barbiturates have been reported following discontinuance of chlordiazepoxide HCl. Potential benefits of use in pregnancy, lactation or women of childbearing age should be weighed against possible hazards to mother and child. Clinical data inadequate on safety in pregnancy.

Precautions: In elderly and debilitated patients, limit dosage to smallest effective amount of chlordiazepoxide (initially 10 mg or less per day) to preclude ataxia or oversedation; increase gradually as needed and tolerated. Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects—particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in patients with impaired renal or hepatic function. Paradoxical reactions to chlordiazepoxide (*e.g.*, excitement, stimulation and acute rage) have been reported in psychiatric patients. Employ usual precautions in the treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation very rarely reported in patients receiving Librium® (chlordiazepoxide) and oral anticoagulants.

Adverse Reactions: Untoward effects seen with either compound alone may occur with Menrium. With chlordiazepoxide, drowsiness, ataxia and confusion reported in some patients, particularly in the elderly and debilitated; while usually avoided by proper dosage adjustment, these are occasionally observed at lower dosage ranges. Also reported have been a few instances of syncope; isolated occurrences of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido, and occasional reports of blood dyscrasias, including agranulocytosis, jaundice and hepatic dysfunction. Periodic blood counts and liver function tests advisable during protracted treatment. Changes in EEG patterns (low-voltage fast activity) observed during and after chlordiazepoxide treatment.

With estrogens, headache, nausea and vomiting, anorexia, gastrointestinal discomfort, dysuria and urinary frequency, jitteriness, breast engorgement, formation of breast cysts, skin rashes and pruritus occasionally seen. Administration may also be associated with uterine bleeding and/or followed by withdrawal bleeding.

Usual Dosage: One tablet t.i.d. for 21 days, followed by one-week rest periods.

Menrium® T.I.D.

5 mg chlordiazepoxide	5-2	0.2 mg water-soluble esterified estrogens
5 mg chlordiazepoxide	5-4	0.4 mg water-soluble esterified estrogens
10 mg chlordiazepoxide	10-4	0.4 mg water-soluble esterified estrogens

Each 5 cc. contain erythromycin estolate equivalent to 250 mg. erythromycin base.
When mixed as directed, each 5 cc. will contain erythromycin estolate equivalent to 125 mg. erythromycin base.
When mixed as directed, each cc. will contain erythromycin estolate equivalent to 100 mg. erythromycin base.
Each 5 cc. contain erythromycin estolate equivalent to 125 mg. erythromycin base.
Each tablet contains erythromycin estolate equivalent to 125 mg. erythromycin base.
Each Pulvule® contains erythromycin estolate equivalent to 125 mg. erythromycin base.
Each Pulvule contains erythromycin estolate equivalent to 250 mg. erythromycin base.
PINT (473 cc.) M-148
ILOSONE LIQUID
ERYTHROMYCIN ESTOLATE ORAL SUSPENSION, U.S.P.
125
SHAKE WELL BEFORE USING
REFRIGERATE AVOID FREEZING
ILOSONE LIQUID
ERYTHROMYCIN ESTOLATE ORAL SUSPENSION, U.S.P.
250
ILOSONE CHEWABLE
ERYTHROMYCIN ESTOLATE TABLETS, N.F.
125 mg.
100 PULVULES No 375
ILOSONE ERYTHROMYCIN ESTOLATE CAPSULES, N.F.
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900761

Colorado Medical Society Centennial

LAST MONTH THE Colorado Medical Society held its 100th Annual Session and began its Centennial Year.

It was an auspicious beginning of a very special year. Commemorative medallions were on sale, the sellers being members of the Woman's Auxiliary and feminine members of the Society's staff, dressed in costumes of the 1870's. A fine exhibit of the tools and memorabilia of medicine in our region 100 years ago was a real attention getter. Big and little plans for the year were being buzzed and sometimes even whispered throughout the Broadmoor Hotel complex. The big formal announcements concerned publications.

Within the next 11 months the Centennial Committee plans publication of special supplements to this *Journal*, primarily for all Colorado Society members but available to our friends in all other states who may desire them. The supplements will contain a group of illustrated articles on the 100-year history of medical progress in Colorado, of the state's hospitals, public health, school health, industrial health. They will include a study of how medicine was practiced here 100 years ago, will illustrate how and why the Society was "born," and will include a series of breezy, thumb-nail characterizations of each one of the Society's first 100 Presidents.

When the Colorado Society's Centennial year officially ends on Sept. 17, 1971, the Committee plans to bring all these articles and pictures (and perhaps more, by then) together in a hard-back commemorative volume which we have no doubt will become a great collector's item.

Because our six-state *Journal* could not in fairness to the other five states underwrite such a project, the Colorado Society set aside funds three years ago for its Centennial publications. Your editors look forward with pleasure to the privilege, which has been accorded us, of editing these papers for publication.

Spalding Rehabilitation Center Celebrates 5th Anniversary

SPALDING REHABILITATION CENTER, 1919 Ogden St., Denver, will celebrate its fifth anniversary in October, 1970. The 80-bed hospital is dedicated to restorative and rehabilitative care of the medical and traumatic accident and disease patient.

It is operated under the auspices of the Episcopal Diocese of Colorado and was named after the Rt. Rev. John Franklin Spalding, D. D., first bishop of the Episcopal Church of Colorado (1873-1902).

The first patients were admitted to the $1,000,000 facility on October 4, 1965. Since then, more than 2,700 persons of all ages have received either in-patient or out-patient care. In Sept., 1969, Spalding's first major expansion was completed with the dedication of the $287,000 cardiac reconditioning unit named the Frank Borman Wing in honor of the astronaut commander of the Apollo 8 mission.

The Center was, at the time of its opening, and is now, the only kind of medical facility of its type in the Rocky Mountain area. Special emphasis is directed in the care of the stroke, orthopedic, cardiac, and non-infectious pulmonary disease patient. Among its many facilities are those for speech, occupational and physical therapy, social services, and a complete gymnasium with exercise testing room for the evaluation and reconditioning of the cardiac patient.

Spalding's first and present administrator is Jack E. Stiles, 38, who assumed his duties in February, 1965. Administrative policies are set by a 15-member board of directors, headed by Eugene Frink, president; medical policy is established by a Medical Administrative Committee with Dr. Raymond G. Bondi as chairman. There are more than 300 physicians on the Center's formally organized open staff. Patients are admitted on direct referral by their doctor and remain under his care and supervision during their stay.

Disseminated Intravascular Coagulation

DR. SANFORD PECK'S article on Disseminated Intravascular Coagulation, published in this issue of the *Rocky Mountain Medical Journal,* should be studied by all clinicians who are actively involved in the care of hospitalized patients and by pathologists who direct clinical laboratory services. The frequency with which we have encountered fulminant cases of this condition on our autopsy service has been of considerable concern to us.

The gynecologists have long been alert to the rapidly progressive hemorrhage and shock which may be associated with abruptio placenta or as part of the dead fetus syndrome. The acute renal failure and irreversible shock complicating traumatic tissue injury are well known to the surgeon. Both of these conditions have as a common denominator the release of thromboplastin like substances from the damaged tissue which serve to trip the coagulation mechanism throughout the peripheral circulation. The small intravascular clots which form may hang up in the microcirculation of the lungs, kidneys or other tissues resulting in progressive organ failure. The consumption of coagulation factors through this clotting process renders the plasma severely deficient resulting in cutaneous purpura and/or massive hemorrhage.

Disseminated intravascular coagulation is being recognized as a frequent complication of a number of other primary conditions, such as sepsis, cardio-pulmonary bypass surgery, hemolytic diseases and shock from other causes, only to mention a few. These predisposing conditions are succintly outlined in Dr. Peck's paper. If this complication is thought of in time and appropriate laboratory tests are obtained, specific therapy can be life saving. One of the chief conceptual hangups for many physicians is that heparin may have to be administered to a patient who is actively bleeding. Yet, if the hemorrhage is secondary to platelet and factor consumption due to clotting, heparin is the only drug that can reverse the altered coagulation mechanism.

The etiology, pathophysiology, predisposing conditions, complicating diseases and therapy of this condition are clearly discussed in this paper. The use of schematic diagrams should be of considerable aid to the reader in the grasping of a number of complex concepts. This paper promises to be a notable reference source on the subject.

Elmer W. Koneman, MD
Pathologist,
Presbyterian Medical Center,
Denver

Disseminated intravascular coagulation*

How often have you missed it?

Sanford D. Peck, MD, Denver

Disseminated intravascular coagulation is a frequent, often fatal complication of many disease states. Prompt recognition and prompt therapy may be life saving.

Disseminated intravascular coagulation (DIC) is the deposition of fibrin in small vessels and may be life threatening or may cause devastating illness. Coagulation may be localized to one or several organs, or it may be present throughout the body. DIC has multiple etiologies and it may produce a number of clinical syndromes.

How frequent is this problem? Several recent reports cite suggestive evidence of DIC in 85 per cent of 47 cases of renal disease,[1] 67 per cent of 24 cases of malignant hypertension,[2] 38 per cent of 141 cases of abruption of the placenta,[3] 30-60 per cent of patients with carcinoma,[4] 25 per cent of patients with normotension and septicemia, 100 per cent of patients with hypotension and septicemia,[5] and in 100 per cent of patients with severe post TUR hematuria.[6] In a clinical survey conducted at this institution, we found evidence of DIC in 90 per cent of nine patents with positive blood cultures, all of whom had clinical disease explainable by DIC, and in 37 per cent of 54 patients with negative blood cultures (with clinical sepsis), half of whom had clinical disease explainable by clotting.

*From Department of Pathology, Presbyterian Medical Center, Denver.

Of what importance is DIC clinically? In our experience, approximately one-tenth of autopsies exhibit evidence of DIC. Additionally, the number of cases of chronic organ failure due to this complication can only be speculated.

The purpose of this paper is to develop the concept of DIC, to determine how to make the diagnosis, and to establish the treatment.

The Coagulation Mechanism— Physiologic Considerations

Blood is fluid and includes a coagulation mechanism and a trigger for its activation (present in the tissues). The physiologic importance of this complicated and intricate mechanism is the benefit derived from its action in the repair of small defects in the vascular system. Capillaries are injured by the slightest trauma, and the coagulation mechanism is activated to repair the damage. Since capillaries are present throughout the body, the manifestations of clotting within them may be widespread. A simplified representation of the coagulation mechanism is presented in Fig. 1. There are two systems activated when blood vessels are injured. In the intrinsic system endothelial damage leads to physiologic alteration in platelets which aggregate and form a plug or "platelet thrombus." Platelet factors are then released which activate at least six plasma factors. These plasma factors are also activated directly by surface contact resulting from endothelial damage. Two of these plasma factors (factor V and VIII) are consumed. The final result is conversion of prothrombin to thrombin.

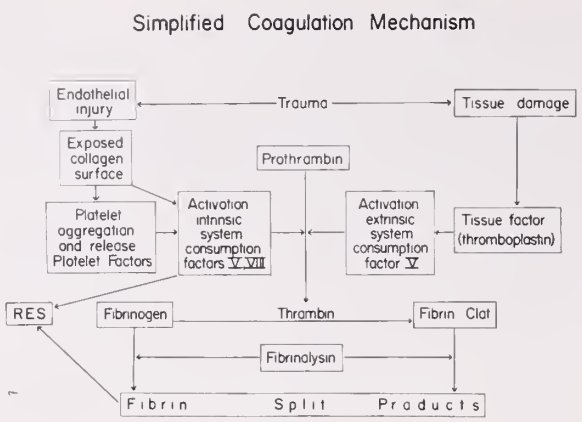

Fig. 1. Simplified diagram of the coagulation mechanism.

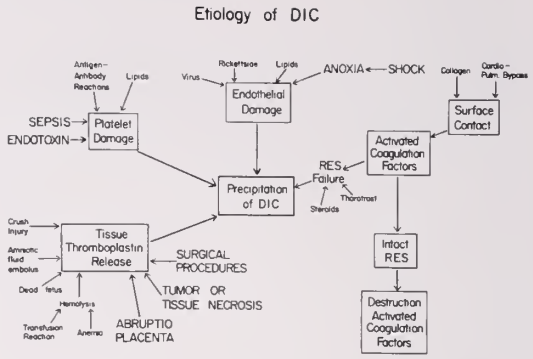

Fig. 2. Schematic diagram illustrating the etiologies of DIC.

Simultaneously, the extrinsic system is activated when injured tissue releases a factor referred to as "tissue thromboplastin." This material activates three plasma factors and results in a conversion of prothrombin to thrombin with the consumption of factor V. Thrombin enzymatically converts fibrinogen into fibrin which is the matrix of the clot.

The formation of fibrin activates a system for its removal. This "fibrinolytic system" involves the enzyme plasmin, the action of which is to dissolve the clot. The breakdown products (fibrin split or degradation products) resulting from this action are removed from the circulation by the cells of the reticuloendothelial system (RES). The RES also is thought to control hypercoaguability by clearing activated plasma clotting factors from the circulation.[7]

Clearly there is a delicate balance between coagulation, fibrinolysis and the RES which tends to maintain homeostasis of the intravascular compartment.

Upsetting the Balance

The above discussion leads to a conceptual understanding of DIC. The first vital point in the discussion is to understand how the coagulation mechanism might be stimulated abnormally. Referring again to Fig. 1, five sensitive areas are evident — endothelium, platelets, exposed surface, tissue factor, and the RES. The relationship of these areas to the precipitation of DIC are depicted in Fig. 2.

1. **Tissue factor.** Release of excess tissue factor into the circulating blood may result in DIC. This occurs frequently in placental abruption with placental and decidual fragments entering the maternal circulation, in retained dead fetus, amniotic fluid embolus, hemolysis (red cells contain thromboplastin), tumor necrosis, crush injuries, and after surgical procedures, especially thoracic surgery. Examples of hemolysis include malaria, incompatible blood transfusion, sickle cell anemia, and hemolytic drug reactions. Examples of tissue injury include crush trauma, severe burns, and surgical procedures. Viper snake venom contains a thromboplastin-like substance which may activate the coagulation mechanism in this same way.

2. **Platelet damage.** Damage to platelets results in activation of coagulation. Bacterial endotoxin, septicemia, antigen antibody complexes, lipids, and as stated above endothelial damage may result in platelet damage. Examples of clinical situations in which this occurs include sepsis (due to many species of bacteria including those that produce endotoxin), systemic lupus erythematosis, glomerulonephritis, and fat embolus.

3. **Endothelial damage.** Endothelial damage exposes collagen which damages platelets and coagulation is activated. This damage is most commonly caused by anoxia, but may be produced by viruses, rickettsia, and lipids. Clinical examples are Rocky Mountain spotted fever, cyanotic heart disease, fat embolism, respiratory distress syndrome, shock from all causes, and cardiopulmonary by-pass which simulates shock.

4. **Surface contact.** Activation of coagulation may result from contact with irregular surfaces. Circulating particulate matter

(amniotic fluid, glycogen, starch, kaolin, agar, carbon) provides such a surface, and DIC has been reported in amniotic fluid embolus. The oxygenator of cardio-pulmonary by-pass also provides such a surface and DIC is a frequent accompaniment of open heart surgery.

5. **The reticuloendothelial system.** The RES clears activated clotting factors and the previously mentioned particulate matter from the plasma. Dysfunction of the RES may result in an increase in these substances which may lead to hypercoagulability. A precarious situation may thus result and even a minor stimulus may precipitate DIC. Thorotrast and steroids, which block the action of the RES, may result in DIC through this mechanism.

Although some of the above is speculative, it should now be evident that DIC occurs in a wide variety of disease states and encompasses all fields of medicine. The deposition of abnormal amounts of fibrin is important in the pathophysiology of many diseases and is on a par with neoplasia, inflammation, and cell death as a contributing factor to morbidity and mortality.

Diagnostic Clinical Considerations

The age old medical cliche "If you don't think of it you'll never make the diagnosis" applies here. After all, DIC did not occur for the first time ten years ago when it was first recognized; it has been occurring for thousands of years. Many physicians, when becoming aware of this phenomenon, remember patients who in retrospect probably had DIC complicating some other problem. The investigation of the patient for DIC begins with the recognition that it could be present. Referring to Fig. 3, the most common presenting clinical states due to DIC are reviewed. The most common form of organ failure is renal shutdown, manifested by oliguria or anuria with or without the usual chemical abnormalities of renal failure.

Pulmonary failure with dyspnea and cyanosis may be other signs of DIC. Liver chemical abnormalities or physical signs of acute liver failure, diarrhea or severe abdominal cramps, and stroke-like syndrome all may be signs of organ failure due to DIC. Of course, DIC is not the only cause of the above symptomatology, but it should be thought of as part of the differential diagnosis in the presence of appropriate etiologies. Bleeding is the sign that makes many think of DIC, but this occurs in only ¼ to ⅓ of patients. It is an important sign that should be recognized especially if unusual in character. For example, petechiae, ecchymosis, mucous membrane bleeding, hematuria, wound oozing (surgical or puncture) that cannot be explained by a lesion such as an ulcer, severed vessel, hemangioma, or other obvious cause, should suggest a diagnosis of DIC.

Shock is perhaps on a par with oliguria and bleeding as a sign of DIC, and as mentioned above, may also be a predisposing cause. With widespread fibrin deposition, especially in parenchymatous organs, blood flow to the right heart is decreased and cardiac output is also reduced. Because DIC may be due to shock it is clear that there may be a vicious circle with shock causing DIC causing more shock. The phenomena of shock in the face of high central venous pressure and little or no pulmonary edema may occur as a result of a "localized" DIC involving the lungs. Blockage of the pulmonary capillary bed by fibrin backs blood up in the venous system, increasing central venous pressure. Blood cannot get through the lungs to the left heart so cardiac output is low and there is a variable degree of shock.

The degree to which DIC occurs is highly variable, ranging, for example, from unrecognized fibrin thrombi in the renal glomeruli causing transient, reversible oliguria, to massive intravascular coagulation involving multiple organs resulting in renal failure, liver

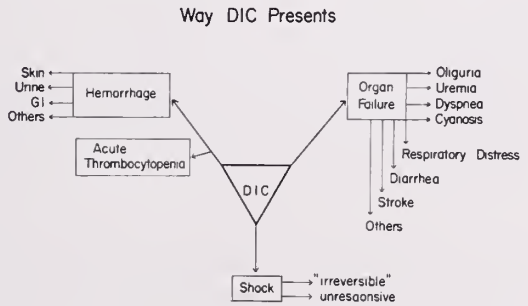

Fig. 3. The major clinical manifestations of DIC.

failure, irreversible shock, and generalized multiportal bleeding. Occasionally the fibrinolytic activation due to DIC removes all the clots but also prevents the formation of more clots which results in hyperfibrinolysis and bleeding. A primary form of hyperfibrinolysis probably does occur but is very rare. In summary, a patient with any of the potential clinical settings mentioned above should be watched for any sign of unexplained organ failure which may be explainable by thrombi, or any sign of abnormal bleeding.

Diagnostic Laboratory Considerations

Unfortunately not all laboratories are able to perform detailed coagulation studies, but usually clinical acumen and a few basic tests are sufficient to diagnose DIC. When blood clots form, that is, when plasma is converted to serum, there is the consumption of factor I (fibrinogen), II (prothrombin), V (labile factor), VIII (antihemophiliac globulin), and platelets. Because the degree of DIC is variable, the *in vivo* drop in the components is variable and sometimes undetectable by crude screening tests.

The platelet estimates by smear or by direct optics are notoriously inaccurate but will be helpful in recognizing severe cases of DIC. A significant acute drop in platelets is suggestive of DIC. The phase contrast platelet count is the most accurate method, having an error of approximately plus or minus 10,000 in good hands. The most common cause for a drop in count of 40,000 to 60,000 within 24 hours is DIC. The greater the drop, the greater the significance.

The *Quick one-stage prothrombin time* measures the extrinsic coagulation mechanism which detects decreases in factors I, II, and V. The *partial thromboplastin time* involves the intrinsic mechanism reflecting drops in factors I, II, V, and VIII. These two tests are crude and in our experience have missed significant drops in the factors as measured by other methods. The measurement of fibrinogen and factor V are more sensitive and are practical, easy and are worth having available even in a small laboratory. Factor VIII assay, although the most sensitive test, is more difficult and not practical in smaller laboratories. The thrombin time (which is performed by adding calcium and thrombin to plasma and measuring the clotting time) is quick and simple. This test reflects low fibrinogen, elevated fibrin split products (FSP) and/or circulating anticoagulants. If the thrombin time is prolonged, the test plasma is serially diluted with saline and the clotting time measured. If the test becomes more prolonged as the dilution increases, the reason is low fibrinogen. If it becomes shorter, the cause is circulating anticoagulant or fibrin split products. If the circulating anticoagulant is heparin (which is the most common) the thrombin time will be corrected by adding protamine to the test plasma. If protamine does not correct the thrombin time, the cause is probably elevated fibrin split products. Direct tests for fibrin split products are available but involve immunologic procedures, special training and significant amounts of time. The detection of elevated FSP either by direct immunologic tests or indirectly by the thrombin time, in the absence of hyperfibrinolysis, is diagnostic of DIC.

The presence of hyperfibrinolysis may be tested for by observing a blood clot. Normally a clot should not dissolve within 24 hours; however, the clot may dissolve in two hours in the presence of hyperfibrinolysis. A much quicker and more sensitive test is the euglobulin lysis time. In this test the substrate is a purified plasma clot, also sensitive to fibrinolysis. The normal time is greater than 45 minutes. This procedure is simple and gives needed information much sooner than the whole clot lysis. These diagnostic tests are listed in Table 1.

One further test, the ethanol gelation test, has been advocated in the early detection of DIC, but in ours and other hands has been too insensitive. The postmortem diagnosis of DIC is difficult because after death fibrinolysis is activated and the clots dissolve.

Table 1
Diagnostic Tests for DIC

Measured	Simplest (least sensitive)	Best (most practical)
Factors	PTT, Protime Fibrinogen	Factor V Assay Fibrinogen
Platelets	Smear estimate	Platelet count
Fibrinolysis	Clot Lysis Thrombin Time	Euglobulin Lysis Fibrin Split Products

Persistent fibrin clots may be detected by the PTAH stain (phosphotungstic acid hematoxylin) which is done on formalin fixed tissue. The presence of hemorrhagic necrosis, even without thrombi, is suggestive of DIC. The diagnosis is considered established by most authorities if the clinical and/or laboratory findings are as described above, or if multiple fibrin thrombi are found at autopsy.

There are several complicating events that make the diagnosis difficult to establish. Thrombocytopenia may result from therapy with cytotoxic or other chemotherapeutic drugs, x-ray therapy, diseases of the bone marrow, or hypersplenism. These factors usually take a number of days to decrease the platelet count whereas it decreases within hours due to DIC.

Transfusion of greater than 4 or 5 units of stored blood within a period of hours may dilute the platelet count, factor V and factor VIII concentration. Coagulation factors may be decreased because of decreased production in liver disease or inhibited production due to anticoagulant therapy with Coumadin and may give misleading results. Keflin can interfere with the factor V assay and result in false low values. Finally, the amount of anticoagulant used to collect blood is uniformly standardized, and the tests may be falsely low if the hematocrit is low and falsely elevated if the hematocrit is high.

If the above conditions obscure the diagnosis, the presence of fibrin split products and a normal euglobulin lysis time (ELT) are the only tests which may be used to diagnose DIC. If the ELT is abnormal, the chances are overwhelming that DIC is present even though this situation may be present in the rare syndrome of primary fibrinolysis.

Treatment

Four modalities are available for the treatment of DIC: 1. the anticoagulant heparin, 2. the antifibrinolytic Amicar (epsilon-amino-caproic acid), 3. transfusion, and 4. general supportive measures. When are each of these indicated? An understanding of the changes in the coagulation mechanism in DIC, as depicted by Fig. 4, is paramount to the choice of therapy.

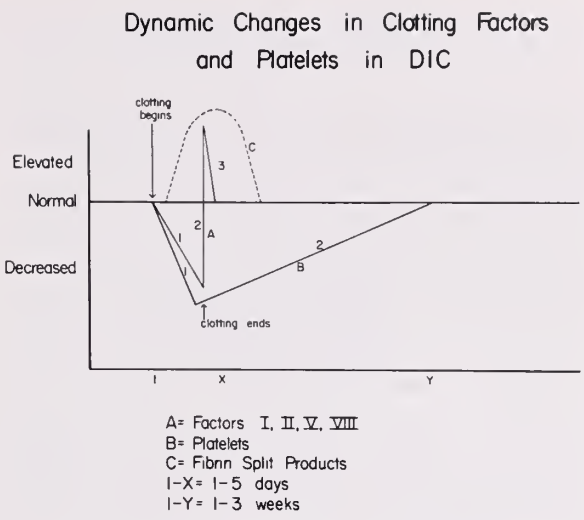

Fig. 4. Graphic representation of the changes in the clotting mechanism in DIC showing relative factor and platelet changes (ordinate) with time (abscissa).

Referring to Fig. 4, observe three curves. Line A represents the changes in the consumable factors (I, II, V, VIII) which drop below normal when DIC occurs, and approach normal when clotting is finished. Frequently the factors rebound above normal as shown. (For example, the fibrinogen may reach levels of 1,000 mgm %). Line B represents the change in the platelet count and its lowest point occurs at approximately the same time that the consumed factors are lowest. Platelets regenerate by cell division and are replaced over a longer period of time than the consumable factors which regenerate by liver synthesis. The fibrin split products (line C) begin to increase a short time after clotting begins, and return to normal soon after it ends. The time intervals given in the graph are approximate and may vary considerably.

What does one do when a patient is in shock, has organ failure or who is bleeding, that is, a patient in whom DIC is suspected? After the appropriate tests are performed, a decision whether to give heparin, heparin plus Amicar, Amicar alone, transfusion, organ support, or nothing must be made. (See Fig. 5)

Heparin. Heparin is given to a patient in whom clotting is suspected. Referring again to Figure 4, notice that clotting is occurring when the consumable factors and platelets

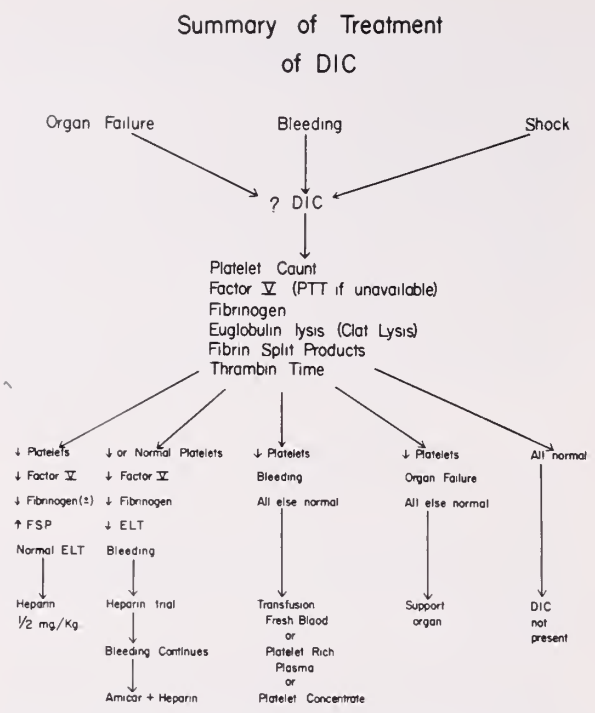

Fig. 5. Basic results of laboratory tests and mode of treatment directed by each.

have decreased (part 1 of the curves). A single set of tests may reflect either part 1 or part 2 of the curves if values for consumable factors and platelets are low. Ideally, then, two sets of tests an hour or two apart should be performed. If the second set is lower than the first, clotting is active. If the second set is higher, then the patient is in the recovery phase. Practically, treatment must be started before serial tests can be completed. Heparin should be started when the platelets and factors are low with the realization that if the patient is in the recovery phase, heparin may cause increased bleeding. But because stage one usually takes more time than stage two, one set of low values will more likely reflect clotting than recovery, and heparin may be given with confidence. The starting dose of heparin is one-half milligram per kilogram intravenously every four hours. Occasionally patients may need one to one and a half milligrams per kilogram every four hours and others may need the drug administered more frequently depending on response.

Heparin and Amicar. Heparin and Amicar are given to a severely bleeding patient with a shortened euglobulin lysis time. Amicar is given two to four hours after heparin is started if the patient is not clinically improving. The fibrinolytic system is inhibited by Amicar and is most often activated by coagulation. If Amicar alone is given to a patient who is clotting, then the natural defense mechanism to dissolve clots (fibrinolysis) is blocked and the vessels may remain plugged. The result is massive infarction of multiple organs and frequently death. Heparin, by inhibiting further coagulation, protects the organs from this potential lethal effect of Amicar. If the clots are already present they will persist if Amicar is given, but heparin will prevent more vessels from being obstructed. Heparin should always be given with Amicar, even in the rare case of primary hyperfibrinolysis, because of the possibility of thrombus formation. The indication for Amicar in a patient with DIC is when bleeding due to hyperfibrinolysis (markedly shortened ELT) poses more of a threat than the possibility of organ failure due to persistent clots. The dose is 4 to 5 grams intravenously at the time the diagnosis is made, followed by 1 gram per hour (up to 30 grams in 24 hours) until bleeding is controlled.

Should Amicar ever be given alone? Probably not. Primary hyperfibrinolysis (that is, hyperfirbrinolysis not due to DIC) is the only possible indication for Amicar alone; however, this condition is extremely rare, and can be virtually discounted in a patient with bleeding and a shortened euglobulin lysis time. The platelet count is the only test that remains normal in primary hyperfibrinolysis. The consumable factors are degraded by fibrinolysis and the fibrin split products are increased resulting in abnormal tests in both conditions.

Transfusion. Transfusions are given to a patient who is symptomatic from bleeding due to thrombocytopenia or from consumed factor deficiency due to DIC. If blood loss during coagulation is life-threatening, fresh whole blood, which contains all of the factors plus platelets is the treatment of choice. In the chronic situation when only thrombocytopenia is present, platelet concentrate or platelet rich plasma is the most logical approach. Stored blood is deficient in both con-

sumable coagulation factors and platelets and has no place in the treatment of DIC.

The older literature refers to DIC as "hypofibrinogenemia" because the pathophysiology was thought to involve only fibrinogen. However, there is probably no place for fibrinogen therapy in DIC. If the patient has the indications for transfusion during clotting, fresh whole blood is needed, not just fibrinogen. Also, the level of fibrinogen rarely drops below 100 mgm per cent even in severe DIC, a level adequate for hemostasis. The risk of hepatitis with fibrinogen approaches 25 per cent per unit and itself is a serious cause of morbidity.

General Organ Support. Organ support is indicated when there are clinical manifestations of organ failure. The usual measures of organ support such as dialysis, tracheostomy, assisted ventilation, variations in the diet and intravenous fluids may be needed. The condition of the patient will, of course, dictate the use of these measures. It is important to closely observe the patient for repeated DIC, because multiple episodes are common.

Summary

Disseminated intravascular coagulation is a common and often devastating clinical event which, if detected early, is reversible by appropriate therapy. This paper develops the concept of DIC by describing the sensitive areas in the coagulation mechanism where clotting may be stimulated, and the etiologic factors which operate at each point. The clinical clues and definitive laboratory tests needed to recognize and to diagnose this condition are discussed in detail. Finally, the treatment of DIC is summarized for each of the common sets of laboratory test results.

The references include four excellent in depth summaries of DIC.[7,8,9,10]

ACKNOWLEDGMENT

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Fetal infection via the amniotic fluid*

Ralph A. Franciosi, MD, Denver

The case reports and discussion illustrate the pathologist's role in one aspect of perinatal medicine, i.e. intrauterine infection.

FORTUNATELY, if one follows 1,000 pregnant women from 20 weeks gestation to delivery, approximately 970 will leave the hospital with a living infant.[1] Perinatal medicine is concerned with the thirty failures in addition to the abortions prior to 20 weeks gestation. Perinatal is a pertinent term since it depicts birth as an event in life, not its beginning. Indeed a "generation gap" exists between the fetus and newborn. Bridging this gap will require close cooperation between obstetrician and pediatrician. The foundation for this cooperation must be based upon facts collected about the fetus and his intra-uterine environment, always keeping foremost in mind the safety of the mother. Careful examination of placental and fetal tissue by the pathologist is an important part of this effort.

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CASE REPORTS

Case 1: A 3 lb. 3 oz. (1,452 gm) white male was transferred to Denver Children's Hospital at 4 hours of age with severe respiratory distress. The infant was delivered at 32 weeks gestation to a mother who was gravida π, para π. There was a history of rupture of membranes 30 hours prior to delivery. No placenta was available for study. A portion of umbilical cord removed from the infant showed a severe funisitis. (Fig. 1) A diagnosis of congenital pneumonia was made, and the infant was treated successfully with Ampicillin and Kanamycin.

Comment: Approximately 3 per cent of all deliveries are associated with rupture of membranes longer than 24 hours prior to delivery.[2] 18 per cent of these deliveries result in an infected fetus or infant.

Examination of the placenta is important to document intrauterine infection. Unfortunately the placenta is not routinely examined, even in high-risk cases, e.g. prolonged rupture of membranes.

Respiratory distress in a newborn is not a specific diagnosis. Most cases are thought to represent hyaline membrane disease. Since many cases are treated with antibiotics, no doubt, cases of congenital pneumonia, such as that presented, are overlooked.

Case 2: A 2-day-old white male, weighing 5 lbs. 11½ oz. (2600 gm) was transferred to Denver Children's Hospital with lethargy, poor feedings and a temperature of 102° F. The infant was delivered at 37 weeks gestation to a mother who

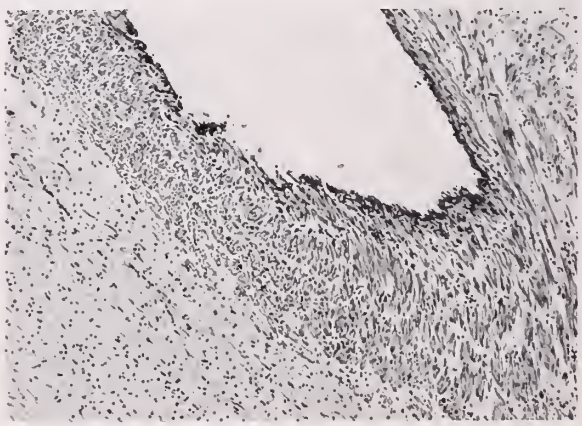

Fig. 1. Marked infiltration of the umbilical vein and Wharton's jelly by neutrophils. 40x

Table 1

Intrauterine Infection

Bacterial	Viral	Fungal
Coliforms	Rubella	Candida
Strep.	Inclusion virus	
Staph.	Herpes	
Listeria		

Protozoal	Spirochetal	Mycoplasma
Toxoplasmosis	T.pallidum	
Malaria	Borrelia	

was gravida I, para I. Shortly after birth the infant was noted to be lethargic. Physical examination upon admission to Children's Hospital revealed an irritable infant with red discoloration at the base of the umbilical cord. Laboratory studies on admission revealed a white blood cell count of 2000 per cu. mm with a differential of 66 lymphocytes, 22 monocytes and 12 neutrophils. There were 400 nucleated RBC's/cu.mm A spinal tap revealed clear fluid, containing 55 WBC, 90 per cent of which were neutrophils. Neisseria meningitides was cultured from the cerebrospinal fluid, blood and nasopharynx. The infant was treated with Ampicillin with marked improvement. He was discharged on the twenty-first hospital day.

Comment: Neisseria meningitides is a rare cause of meningitis in a newborn.[3] Failure to examine the placenta in our case hindered the attempt to prove that this infection occurred in utero. The observation, however, that the infant was symptomatic shortly after birth leaves no doubt that the infection occurred in utero.

Red discoloration at the base of the umbilical cord of an infant is often interpreted clinically to indicate the entry side of organisms causing sepis. On the contrary this redness usually represents inflammation of the umbilical cord (funisitis) that occurred in utero.

The newborn infant should have a white blood cell count in the range of 15-20,000/cu.mm. A low white cell count with a relative or absolute lymphocytosis suggests one of the following: sepsis, asphyxia, congenital neutropenia (including maternal anti-leukocyte antibody), and leukemia.

Discussion

Infection of the fetus in utero can occur through the placenta (transplacental) or via the amniotic fluid.[4,5] (Fig. 2) The former is associated with the presence in the maternal blood stream of the offending organism, while

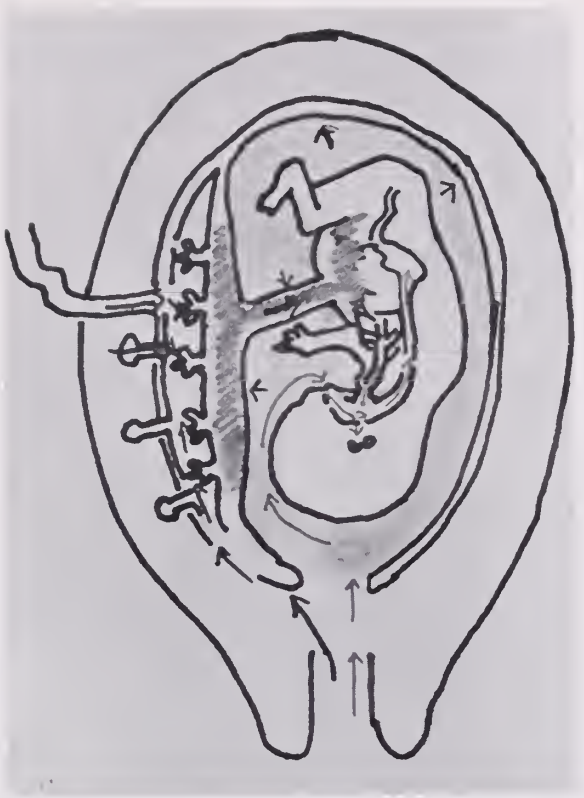

Fig. 2. Arrows depict the routes of intrauterine infection. The maternal arterial system is represented by the channel entering the uterus in the upper left portion.

the latter relates to an ascending cervical infection. Table 1 illustrates the commonly reported organisms causing fetal infection. The bacteria and fungi[6] with the exception of Listeria commonly infect the fetus via the amniotic cavity. Listeria, viruses, protozoa and spirochetes usually infect the fetus transplacentally. The mode of infection by mycoplasma organisms is not clear, but most likely occurs via the amniotic fluid.

This discussion will be limited to the pathogenesis of amniotic infection. In essence, amniotic infection occurs as an ascending process originating in the vagina or cervix. The organisms usually enter the amniotic fluid through ruptured membranes although cases have been reported in which no prolonged rupture was noted. This would imply then that penetration of intact membranes can occur. Once within the amniotic fluid the organisms can elicit an inflammatory response from maternal and fetal tissues. The neutrophilic maternal response is primarily

in the decidua caspularis. The initial fetal response is observed in the placenta and umbilical cord. The placenta shows leukopedesis in the chorionic vessels into the chorion and then into the amniotic cavity. A similar response in the umbilical cord vessels allows a migration of leukocytes through the vessel wall into the substance of the umbilical cord. The fetus can become infected by a number of routes, i.e. direct penetration of the umbilical cord or placental vessels, swallowing organisms into the gastrointestinal tract with resultant septicemia and aspiration with resultant pneumonitis and/or septicemia. Septicemia can result in disseminated visceral involvement, particularly meningitis.

Inflammation of the placenta and umbilical cord is not specific for intrauterine infection. Meconium stained amniotic fluid and fetal death can result in similar inflammation. In the absence of the latter conditions one must suspect intrauterine infection.

Although the placenta and umbilical cord are involved in almost all cases of intrauterine infection, the fetus is not necessarily infected. Indeed premature birth of a non-infected infant is the most frequent result of amniotic infection. Since prematurity is the leading cause of morbidity and mortality in the newborn this should stimulate us to explore in detail any condition which predisposes to it.

Summary

Two cases of neonatal infection acquired in utero are presented and commented upon. A general discussion of fetal infection via the amniotic fluid is presented.

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MATERNAL MORTALITY

The following case has been reviewed by the Colorado Maternal Mortality Committee* and selected for publication because of its educational value.

Amniotic Fluid Embolism with Disseminated Intravascular Coagulation Syndrome

AMNIOTIC FLUID embolism is a rare obstetrical emergency which has proved fatal in 85 per cent of the cases reported in the literature.[1] The patient presents a very classic picture. She is usually a multipara in tumultuous labor who develops acute respiratory distress, shock, circulatory collapse and coma.[2] There is nothing in the patient's prenatal course which prepares the physician for the series of events which will confront him when his patient goes into labor. Moreover, once the diagnosis is made there is little he can do to prevent her death. Yet, it is hoped that the presentation of the following case will help us to recognize the clinical symptoms of amniotic fluid embolism and the medical measures which have proved successful in some cases.

Case

A 37-year-old female, gravida four, para three, of forty-one weeks gestation was admitted to the hospital for elective induction. Her blood pressure was 120/70, respiration 16, pulse 64, and fetal heart tones were 132. The patient's cervix was one to two centimeters and 60 per cent effaced. One tablet of bucal pitocin was administered every thirty minutes over a two-hour period for a total of four tablets. Her contraction were three minutes apart, lasting forty seconds and were of moderate quality. Thirty minutes after the last dose, her blood pressure was 90/60; fetal heart tones were 120; the cervix was two centimeters, 80 per cent effaced; and her pulse was eighty-four. The patient complained of a sharp, shooting pain radiating to her back and neck. She vomited and stated that she felt that the bag of waters had ruptured. Nurse's notes state she seemed very uncomfortable but that the uterus was relaxing between contractions. She was given Demerol 100 mg. intramuscularly. She again complained of severe pain radiating to her back and was quite nauseated. The cervix was five centimeters dilated, fetal heart tones were varying between 80 and 120, contractions were two minutes apart and very strong. The patient was taken to the delivery room where the membranes were ruptured and a pudendal and paracervical block were given. Five minutes later the patient was completely dilated and at seven minutes following complete dilation she delivered a viable infant by outlet forceps over a midline episiotomy. Total labor and delivery was completed in fifty-one minutes. The patient had dark moderately heavy vaginal bleeding. Her blood pressure dropped, pulse increased, and she became cyanotic. Manual exploration of the uterine cavity failed to reveal any tear or tissue. The patient then was noted to be bleeding from all veni puncture sites and abdominal distention occurred. The patients was treated with six units of whole blood. The clinical diagnosis of amniotic fluid embolism was made and the patient was heparinized and treated with Solu-Cortef and given Fibrinogen, Ergotrate and Amicar. Approximately three hours later the patient had a cardiac arrest and was defibrillated. The patient was transferred to the intensive care unit where her pupils were found to be dilated and fixed. She had had no urine output or discernible blood pressure since the time of delivery. Four hours later the patient expired. Other medications that were used during the last few hours included sodium bicarbonate, calcium gluconate, Lasix, Mannitol, Levofed, Isuprel, Decadron, Glucagon and digitalis.

Autopsy findings confirmed amniotic fluid emboli present in lungs bilaterally and in the sternal bone marrow. There was a massive hematoma of the left broad ligament with disseminated intravascular coagulation syndrome (clinical). •

*The following physicians have been appointed to serve on the Maternal Mortality Committee, a subcommittee under Maternal and Child Health: Horace E. Thompson, Chairman, E. N. Akers, Maxwell A. Abelman, L. Joseph Butterfield, Warren E. Cooper, Gerald W. Del Junco, Lawrence W. Roessing, all of Denver; John H. Darst, Greeley; Harold L. Dyer, Colorado Springs; Richard R. Hansen, Fort Collins; Ronald E. Harrington, Boulder; James R. Patterson, Englewood; Louis C. Wollenweber, Jr., Lakewood.

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Prophylactic versus therapeutic oophorectomy in stage 1 and 2 breast cancer in Utah*

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IT HAS BEEN KNOWN FOR many years that ovarian estrogenic hormones have profound influence on the growth rate of some breast cancers. For over 30 years oophorectomy has been employed as an adjunct to mastectomy in treatment of advanced breast cancer in premenopausal female. Oophorectomy when performed immediately following the initial therapy without evidence of residual or recurrent disease has been referred to as prophylactic castration, whereas oophorectomy when done at the time of recurrence of cancer following mastectomy is referred to as therapeutic oophorectomy.

Prophylactic or therapeutic oophorectomy in treatment of breast cancer has remained a major controversial issue among clinicians for many years. Most of the prophylactic castration advocates claim that this approach delays the onset of recurrence following mastectomy, increases survival time, and increases cure rate. In 1964 Kennedy, L., et al.,[1] in his comparative analysis of 296 patients who had prophylactic or therapeutic castration, concluded that prophylactic castration tended to lengthen the period from initial mastectomy to recurrence of the disease. However, the total survival time from the initial therapy to death was the same in both groups. Also in 1964, Cole's report[2] on Patterson and Russell's well-defined study of 369 patients castrated shortly after mastectomy revealed five-year survival rate of 58.3 per cent whereas the five-year survival rate of 378 patients who were not castrated follow a mastectomy was 52.6 per cent (Fig. 1).

It has been established that therapeutic oophorectomy has a favorable effect in premenopausal female patients with recurrent or metastatic breast cancer. A review of the literature[3,5,6,7,9,10] reveals that the beneficial effect is due to the reduction in estrogenic hormone activity and that the favorable response does occur in about 30 per cent of patients with advanced breast cancer. The favorable responses include relief of pain, increase in appetite, weight gain, and shrink-

**A computerized registry system, a confederacy of Colorado, Idaho, Montana, Wyoming and Utah state tumor registries. This is planned as a bi-monthly publication in the RMMJ.

*From the Department of Surgery, University of Utah College of Medicine; the Utah State Tumor Registry, Intermountain Regional Medical Program, Tumor Registry, Rocky Mountain States Cooperative Tumor Registry, Salt Lake City, Utah. Presented at the Annual Scientific Meeting of the Utah Chapter of the American College of Surgeons, January 30, 1970, Salt Lake City.

age of metastatic lesions. Therapeutic oophorectomy proponents recommend that oophorectomy should be employed as a therapeutic measure for recurrent or metastatic tumor and that the subsequent sequence of hormonal therapy should be determined by response to oophorectomy.

Since Schinzinger[12] proposed oophorectomy for premenopausal females with breast cancer in 1889 many reports have been published in support of either prophylactic or therapeutic oophorectomy. Unfortunately, most of these studies were not well controlled and therefore the results are not definitive. To date there has been no adequate comparative analysis of prophylactic versus therapeutic oophorectomy in treatment of breast cancer. The present investigation is not a controlled study but a non-selected comparative analysis of the two forms of therapy as found in the State of Utah.

Materials and Methods

The study includes the patients who underwent either prophylactic or therapeutic oophorectomy following mastectomy for Stages I and II breast cancer from January 1957 to January 1969. The data were obtained from the Utah State Cancer Registry. The criteria used for selection of patients were: (1) Premenopausal patients with active physiological menstrual cycles. (2) Initial therapy was either radical or simple mastectomy. (3) Only those patients with Stage I and II breast cancer were included. Those premenopausal patients who had undergone oophorectomy prior to the initial diagnosis of breast cancer and also those who had undergone castration for other reasons such as pelvic tumors or dysmenorrhea were excluded from the study.

Results

Fig. 2 shows the survival distribution of 131 patients who had oophorectomy, of which 61 were prophylactic and 70 were therapeutic with Stage I or II breast cancer. The ages in both series were similar.

Comparison was made between the prophylactic and therapeutic oophorectomy series in respect to total survival in years from diagnosis to death (Fig. 3). There were

FIGURE 1

BREAST CANCER

PROPHYLACTIC VS. THERAPEAUTIC CASTRATION

5 YEAR SURVIVAL RATE

		NUMBER OF PATIENTS	PROPHYLACTIC	THERAPEAUTIC
1956	MC WHIRTER	768	IDENTICAL IN BOTH GROUPS	
1959	ROSENBERG ET AL	200	59%	36%
1963	RANNAE	130	60.6%	47%
1964	NISSEN-MEYER	179	54.2%	51.6%
1964	COLE (PATTERSON & RUSSELL)	378	58.3%	52.6%

FIGURE 2

BREAST CANCER - UTAH

TOTAL SURVIVAL IN YEARS FROM DIAGNOSIS

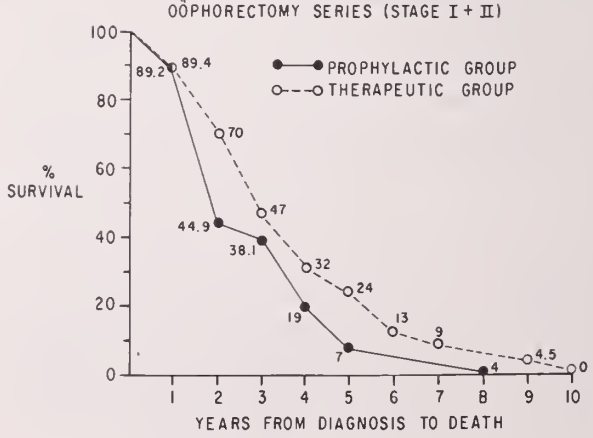
	PROPHYLACTIC 61 PATIENTS				THERAPEAUTIC				94 PATIENTS
	STAGE I		STAGE II		STAGE I		STAGE II		STAGE III
YEARS	ALIVE	DEAD	ALIVE	DEAD	ALIVE	DEAD	ALIVE	DEAD	DEAD
0-1	8		9	2	1		1	5	3
1-2	1	2	7	6		4	3	5	10
2-3	2	1	2		2	2	2	9	3
3-4			3	3	2	3		4	5
4-5	2		3	2		2		2	
5-6			1		2	1	2	4	
6-7	2				1		1	2	
7-8		1	1				1		2
8-9					1	1		1	1
9-10					2	1	2	1	
10-11									
11-12	1		1						
12-13			1						
TOTAL	16	4	28	13	11	14	12	33	24
MEAN	42 MONTHS		27.14 MONTHS		45 MONTHS		39.6 MONTHS		31.6 MONTHS
MEDIAN	36 MONTHS		20 MONTHS		37 MONTHS		30 MONTHS		24 MONTHS
STAGE I & II	MEAN 30.6 MONTHS MEDIAN 24 MONTHS				STAGE I & II		MEAN 41.2 MONTHS MEDIAN 32 MONTHS		
AGES	PROPHYLACTIC GROUP				MEAN 42.8 YEARS		MEDIAN 44 YEARS		
	THERAPEAUTIC GROUP				MEAN 45.3 YEARS		MEDIAN 44 YEARS		

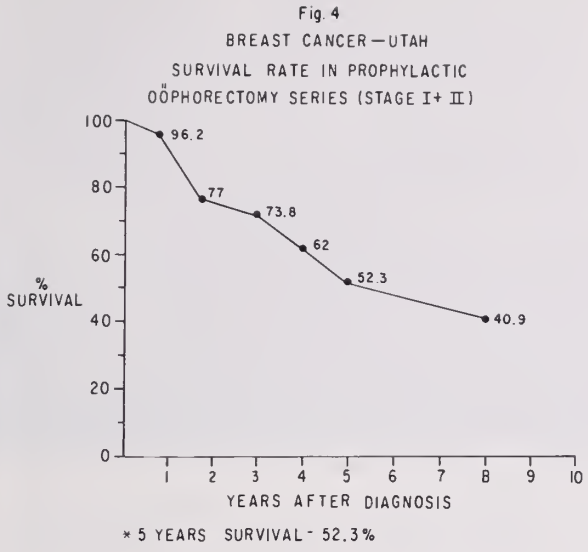
Fig. 3

BREAST CANCER — UTAH

PROPHYLACTIC vs THERAPEUTIC

OOPHORECTOMY SERIES (STAGE I + II)





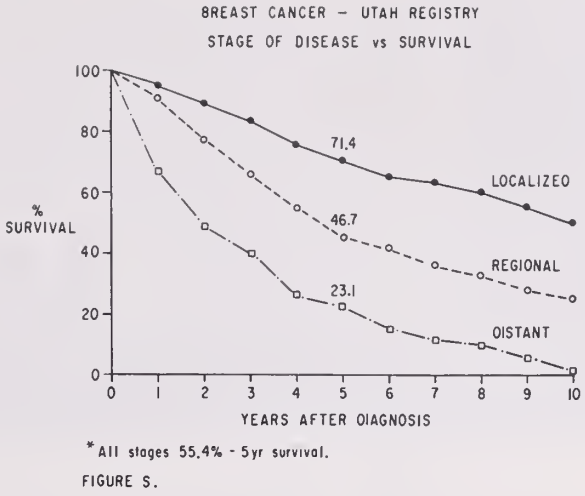


FIGURE 5.

17 patients from the prophylactic series and 47 patients from therapeutic series who died during the 12-year followup period. The interval from diagnosis to death (Stages I and II) was 30.6 mean months and 24.0 median months for the prophylactic group and 41.2 mean months with 32 median months for the therapeutic group respectively.

The five-year survival rate from initial therapy of prophylactic oophorectomy series Stage I and II breast cancer (Fig. 4) and five-year survival rate of the entire breast cancer series (Fig. 5) were analyzed and compared. The five-year overall survival percentage of the prophylactic castration series was 52.3 per cent and that of the entire breast cancer series with all stages was 55.4 per cent (2,308 patients in Utah Registry).[13]

Discussion

In the therapeutic oophorectomy series the mean interval from diagnosis to death of 41.2 months was significantly greater than the mean interval of 30.6 months for the prophylactic oophorectomy group. The median interval of the therapeutic series of 32 months was also significantly greater than the prophylactic group of 24 months. These limited data suggest that either therapeutic castration prolongs survival time of patients with recurrent breast cancer or that prophylactic oophorectomy decreases survival time from initial breast cancer therapy to death or that patients with more extensive disease were selected for prophylactic castration.

Also from the five-year survival data, prophylactic oophorectomy does not offer a better five-year survival rate than that of the entire breast cancer series (all stages) treated by various methods, namely: mastectomy, oophorectomy, radiation, adrenalectomy and chemotherapy in various combinations.

In comparative analysis of prophylactic versus therapeutic oophorectomy, it is important to realize that large numbers of the prophylactic series have actually been cured by mastectomy. Fitzpatrick found in our state[13] that 71.4 per cent of patients with Stage I breast cancer survived five years. Prophylactic oophorectomy would have been worthy of a trial in less than 28.6 per cent and only one third of these would be expected to benefit. Other disadvantages of prophylactic oophorectomy include osteoporosis, unnecessary psychic trauma to patients and loss of an indicator of estrogen dependent tumor. Therefore, oophorectomy in most of those patients would be unnecessary additional surgery with its accompanied morbidity and probably mortality. It would be only reasonable to compare the prophylactic series with recurrent disease with therapeutic series. For this reason, comparison of the interval from initial tumor therapy to recurrence is of less importance than total survival time from mastectomy to death.

Summary

A comparative analysis of 131 patients with Stage I and II breast cancer who underwent prophylactic or therapeutic oophorectomy following mastectomy is presented. Our results have not supported the use of prophylactic oophorectomy. In fact, those patients who underwent therapeutic oophorectomy lived almost a year longer than the prophylactic group. Therapeutic oophorectomy prolonged the period from recurrence of cancer to death. The five-year survival of the prophylactic oophorectomy group (Stage I and II) was no better than for all stages of breast cancer combined. •

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Tumor Conference from University of Colorado Medical Center

Edited by Erick R. Ratzer, M.D.

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Dr. Larsen:

In March 1966, this seventy-year-old white male was referred by his family physician to the Denver VA Hospital because of a mass in the left breast slightly lateral and inferior to the nipple. Three months prior to this he noted that the left nipple was sore and red. Over the next six weeks there was gradual, progressive swelling in the breast near the nipple. There was no nipple discharge nor any changes in the opposite breast. He had taken no medicines at this time, and prior to this had enjoyed good health. Physical examination was entirely normal with the exception of the left breast nodule which measured 2.0 cm in diameter. Chest roentgenogram revealed a nodule in the left lower lobe of the lung. Liver scan and liver function tests were normal. Following a needle biopsy which revealed adenocarcinoma, a left simple mastectomy was done on March 16, 1966. Before leaving the hospital a bilateral orchiectomy was also done because of the evidence of pulmonary disease.

There was complete disappearance of the pulmonary nodule by chest roentgenogram very promptly after the orchiectomy. The remission lasted until late 1967 when again pulmonary nodules appeared on the roentgenogram. In February 1968, the patient was re-evaluated because of definite progression

of the disease. Adrenalectomy was recommended, but the patient refused, and consequently a course of weekly triethylene thio phosphoramide (Thio-tepa) was begun. The pulmonary nodules disappeared soon after initiation of the Thio-tepa. This remission lasted for one year.

In June, 1969, the pulmonary nodules reappeared, and the chemotherapy was changed to estrogen therapy—first with carbesterol and later diethylstilbestrol. Each of these agents produced a complete response with disappearance of the pulmonary nodules. A left axillary mass which had developed also regressed about 50 per cent. Chemotherapy was discontinued on December 3, 1969, but the axillary mass had continued to shrink. At no time during the course of his illness has he had any symptoms except for mild fluid retention which occurred while on estrogens.

May we look at the x-rays now?

Dr. Johnson:

The first film is from March 1966, prior to his orchiectomy, which shows the metastatic nodule in the left lower lung field. (Fig. 1a). The second one was taken in May 1966 and there is complete disappearance of the nodule after the orchiectomy. Fig. 1b).

This next film was taken in February 1968, and multiple bilateral pulmonary metastatic nodules are present. (Fig. 2a). By September 1968, as this film illustrates, regression of the nodules after therapy with Thio-tepa is apparent. (Fig. 2b).

Finally, in August 1969 there developed recurrence of the lower lobe metastatic nodule (Fig. 3a) which disappeared by October 1961 following institution of estrogen therapy. (Fig. 3b). However, there is still a prominence of the left hilum.

Dr. Hill:

It wasn't mentioned in the history, but several complications or intercurrent illnesses have occurred from time to time in this patient, which raised the question about metastatic disease. In each case, however, I think we have ruled out metastatic disease as the cause of his problems.

First while on carbesterol—which produced a complete regression of incisional

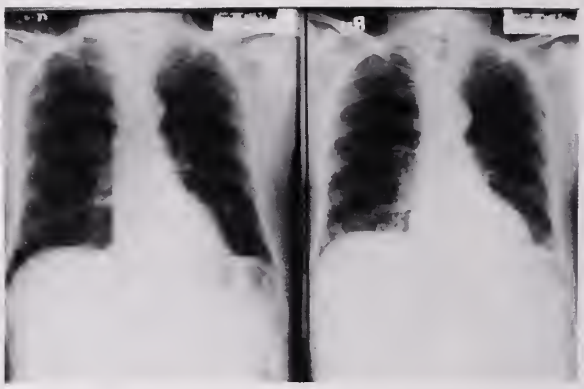

Fig. 1. Left: March 24, 1966 x-ray shows the left lower lobe metastasis prior to orchiectomy. Right: May 19, 1966, x-ray shows the disappearance of the metastatic nodule following orchiectomy.

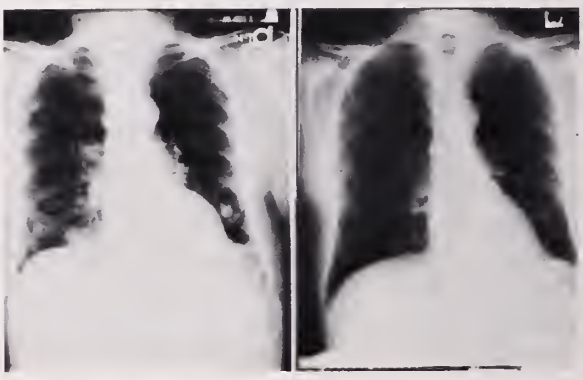

Fig. 2. Left: February 1, 1968. Relapse has occurred with multiple bilateral pulmonary metastatic nodules. Right: September 3, 1968. Regression of the nodules is evident following therapy with Thio-tepa.

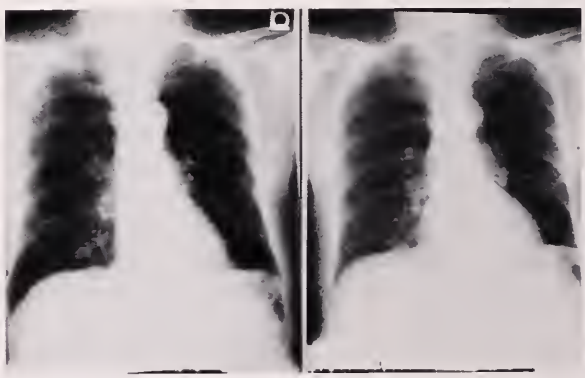

Fig. 3. Left: August 11, 1969. There is recurrence of the right lower lobe metastatic nodule. Right: October 3, 1969. Regression of the nodule following institution of estrogen therapy, but persistent prominence of the hila.

nodules, axillary lymph nodes and pulmonary metastases—he has had at least one episode of renal calculus. Next, he developed anasarca, severe lymphedema, and lymphangitis of his left arm, and he had to be hospitalized for a week. This was a very serious illness requiring tetracycline and penicillin therapy. The third major complication was pneumonia with pleural effusion which was attributed by some to be pulmonary metastasis. But this episode occurred while his disease was in complete remission, and the illness had all the characteristics of severe viral pneumonia. He had a pericardial friction rub, a pleural friction rub, and he was quite ill. However, he recovered without any specific therapy.

Could we see the histology now, Dr. Mulligan?

Dr. Mulligan:

Well, I'm not sure whether we're coming or going on this patient because I don't see any description of a nipple on the gross specimen of March, 1966. An 11 x 24 cm ellipse of skin and a 1.0 cm in diameter lesion projecting 5 to 6 mm above the skin was described. I see three little nodules in the subcutaneous tissue upon which any interpretation could be placed. The most I could say is that possibly this represents mammary carcinoma.

This is the only slide we have, and conceivably what we looked at here is the primary. There is a lot of productive fibrosis as you can see within the tumor and this is par for the course for an infiltrative duct carcinoma.

Normally, in the male breast, and I have sampled only a few of these at autopsy for fear of arousing the ire of the mortician, there are only about four ducts. You can see that the male has a very small chance of getting breast cancer just from the volume of the ducts alone.

Dr. Hill:

Well in this patient it's cancer and it's adenocarcinoma and it occurred in the breast.

Dr. Mulligan:

That's as far as I can tell by the evidence presented.

Dr. Hill:

The differential diagnosis would be prostatic cancer, metastatic to this area?

Dr. Mulligan:

Could be, and I asked Dr. Larsen that specifically the other day because this has been described. It's worthwhile to think about, but I guess we don't have any evidence for it.

Dr. Hill:

No direct evidence histologically?

Dr. Reynolds:

How about a lymphoma?

Dr. Mulligan:

No, absolutely not. To explain further why I am hesistant, the very few carcinomas of the male breast that I have seen have arisen beneath the nipple, and when I received these specimens the nipple was included. This current case does not describe the nipple, and because of this I am not totally confident in the diagnosis.

Dr. Hill:

Today, on physical examination of this patient there is no nipple on the left and therefore we have to assume it was resected.

After the patient refused adrenalectomy in 1968, Dr. Huesby made the suggestion that we try Thio-tepa for palliation. I wonder, Dr. Huseby, if you can tell us the background for that recommendation.

Dr. Huseby:

There was a publication concerning the use of Thio-tepa systemically in breast cancer from Roswell Park a number of years ago.[1] The first "course" consisted of five daily injections of 0.2 mg/kg per day. The response rate was approximately 30 per cent but some were rather short lived.

Over the past several years we have been using Thio-tepa in breast cancer in a somewhat different way — that is giving three times a week over a longer period of time. We have seen some very nice remissions (again approximately in 30 per cent of patients) lasting from four to twelve months.

Dr. Johnson:

Are these patient premenopausal?

Dr. Huseby:

No. In premenopausal women with metastatic breast cancer who need systemic therapy we always start out with oophorectomy. The patients treated with Thio-tepa were all post menopausal (either artificial or natural) and who had some type of endocrine therapy previously for their recurrent disease. Their disease, in all cases, had all either reactivated or had not responded to hormonal therapy. They were all patients with progressive disease and some had received previous therapy with cytotoxic agents.

Dr. Reynolds:

With distant metastasis?

Dr. Huseby:

Yes. Metastases to lung, liver, bones, etc.

Dr. Reynolds:

Do you prefer Thio-tepa for liver over 5 FU?

Dr. Huseby:

If the individual has only liver involvement or primarily liver involvement, I think I would prefer selective arterial catherization and 5 FU. But if they have significant disease in addition to the liver metastasis, I prefer Thio-tepa.

Dr. Hill:

Dr. Larsen has received some studies of male breast cancer. This is not a common cancer, but a fair amount is known about it since it is uncommon, and many of the cases have been reported.

Dr. Larsen:

Cancer of the male breast has only 1 per cent of the incidence of cancer of the female breast, and no single institution has a great deal of experience with it. Kellie and Morris,[2] at the Massachusetts General Hospital reported sixteen cases over a ten-year period, and Houttuin, et al[3] reported twenty three patients from the University of Chicago over a twenty-five year period. Wilson[4] reported twenty patients from the University of Oregon but the number of years included were not mentioned. In the University of Oregon series the five-year and the ten-year survival rates were 61 and 23 per cent respectively. In the University of Chicago series, eight patients had orchiectomy for metastatic disease. Six of the eight had a good response with loss of all evidence of metastatic lesions for periods ranging from three months to five years. Seven patients had adrenalectomy done for metastatic disease. Six of these seven had previous orchiectomy. All patients who had a good response to orchiectomy subsequently had a good response to adrenalectomy. The only poor response to adrenalectomy was a patient who had also failed to respond to orchiectomy. The duration of the adrenalectomy response varied from one to five years.

In the University of Oregon series orchiectomy followed by estrogen therapy produced a good prolonged regression in two patients. Their experience with adrenalectomy in two patients produced only moderate regression. With stilbestrol alone without either orchiectomy or adrenalectomy, five of six patients had either partial or complete responses ranging from five months to seven years.

Dr. Hill:

Does it make any difference whether the patient is a young man or an old man in terms of prognosis from orchiectomy? In the females, of course, the prognosis for improvement after oophorectomy drops off very considerably after the menstrual periods cease. Does age make any difference in men?

Dr. Larsen:

I don't know the answer to that. Most male breast cancer patients are elderly, however, so a comparative evaluation with a fairly large number of patients would be hard to come across.

Dr. Ratzer:

What is known about the testicular function as far as androgen formation? Is the assumption that you are taking out the androgens?

Dr. Huseby:

The assumption is you're taking out the estrogens.

Dr. Ratzer:

In an orchiectomy?

Dr. Huseby:

Yes. As the male gets older androgen production decreases but estrogen production increases slightly. In all probability orchiectomy is effective in male carcinoma of the breast by removal of estrogen. However, this is still guess work.

Dr. Ratzer:

Why is it guess work?

Dr. Huseby:

Well, we do not have any good experimental systems to test it really. Again, we are assuming in the younger female it is the removal of estrogen that is important when you do an oophorectomy; also in the case of adrenalectomy. Adrenalectomy in the male after a castration success is even better than it is in the female.

Dr. Hill:

This also correlates with what we see in that a young man with breast cancer is less likely to respond to orchiectomy than the older man.

Dr. Gallagher:

Another interesting fact is the man who develops massive liver metastasis, and in short order develops big breasts—gynecomastia.

Dr. Ratzer:

What does that mean?

Dr. Gallagher:

He has a lot of estrogen being produced and not being inactivated.

Dr. Hill:

Well, that's probably true unless you assume that some of the cancers we see also make estrogens or estrogen-like compounds, and that certainly is a problem occasionally.

Dr. Ratzer:

Do you have the average duration of life in cancer of the male breast that is not cured? We have a patient here who has gone 4+ years and had a rather striking response to several different drugs, but how long might he have lived without any treatment at all.

Dr. Hill:

I don't know but the rate of progression of his disease was substantial prior to orchiectomy and chemotherapy.

Dr. Ratzer:

But he never felt badly.

Dr. Hill:

Right. I wanted to emphasize that. We haven't any idea what his ultimate survival would have been without any treatment, and twice during therapy we made him quite ill.

Dr. Reynolds:

Don't you think that sometimes just withdrawing the estrogen is therapeutic?—So that this patient is still actually being treated though he is taking no medication.

Dr. Huseby:

It can be therapeutic in the female. I haven't used estrogen in the human male in enough cases to know if it works the same, however.

Dr. Hill:

Would it make more sense to treat him with testerone instead of estrogen?

Dr. Huseby:

In my one case of male breast carcinoma that I did treat with androgen nothing happened. The patient had become refractory to orchiectomy and stilbestrol. This was at a time before we were doing adrenalectomies, so we just gave him androgens. Although nothing happened, it certainly didn't make him worse.

Dr. Hill:

I would like to review our results with carcinoma of the breast treated in chemotherapy clinic in the last three years. We have treated thirty-six patients and thirty-one of these are evaluable. Thirty-five were females and one was a male. (Table 1). At the present time, 21 are alive, 12 are dead and

TABLE 1

BREAST CA CHEMOTHERAPY
UCMC
7/1/67 - 3/26/70

ALIVE	21
DEAD	12
LOST	3
TOTAL	36, of which 31 were evaluable

Responses in 17/31 Evaluable Patients
8/17 Responses are Alive

The 5 Non-Evaluable Patients Have Shown No Progression.

3 were lost to follow-up. In the 31 evaluable patients, 17 had responses. Eight of these 17 are alive and under care right now. The five patients who are not evaluable were treated with long term 5 FU following mastectomy in which multiple lymph nodes in the axilla were positive. None of these patients have subsequently had metastases or recurrences.

A total of 85 courses of drugs were used in the thirty-six patients, (Table 2) and 14 endocrine ablative procedures were used. (Table 3). We are not counting all of the endocrine ablative procedures performed in this hospital, but only the ones that were used in patients who either previously or subsequently were followed in chemotherapy clinic. We used 13 different drugs or hormones for the thirty-six patients. Four patients responded to 5 FU, three responded to Thio-tepa and two responded to Methotrexate. Looking at the hormones, there were two responders to diethystilbestrol, and one responder to carbesterol, which is a synthetic estrogen.

TABLE 2

BREAST CA CHEMOTHERAPY
UCMC
7/1/67 - 3/26/70

No. of Patients	Drug	Responders	Non-Responders	Not Evaluable
31	5 FU	4	23	4
10	Thio-tepa	3	6	1
8	MTX	3	5	0
6	HN_2	2	3	1
2	Cytosine	2	0	0
1	Chlorambucil	0	1	0
10	Diethylstilbestrol	2	4	4
5	Testosterone	0	5	0
4	Fluoxymesterone	0	3	1
3	Prednisone-Cortisone	0	3	0
3	Carbesterol	1	2	0
1	Celestone	0	1	0
1	Testotolactone	0	1	0
85		17	57	11

TABLE 3

BREAST CA CHEMOTHERAPY
UCMC
7/1/67 - 3/26/70
PRIOR OR SUBSEQUENT SURGERY

No. of Patients	Operation	Responders	Non-Responders	Not Evaluable
7	Oophorectomy	5	2	0
4	Adrenalectomy	4	0	0
2	Adrenalectomy + Oophorectomy	2	0	0
1	Orchiectomy	1	0	0
14		12	2	0

The reason that 5 FU was used most commonly is because in general it produces the fewest permanent side effects. It was tried in twenty-seven patients with twenty-three non responders. I believe we may have to re-evaluate our notion that 5 FU ought to be the first drug tried in breast cancer. This is something that Dr. Huseby has been telling us for a long time, and it has taken us about three years to reach the same conclusion.

Cytosine arabinoside was used in two patients, and both of them responded. Cytosine arabinoside is an inhibiter of DNA synthesis, used in leukemia and lymphoma. It was surprising to see it work in breast cancer, but actually, its effect was not impressive enough to warrant its use as a maintenance drug.

I should say that all three responses to Thio-tepa were complete. One was a response that persisted until death a year and a half later of unrelated causes; the other two lasted several months. This is something we have not seen with any of our other drugs. We have not seen any *complete* remissions even on a short-term basis from any other drugs or hormones. In addition to these drug or hormone responders, three other patients responded only to endocrine ablative procedures.

Dr. Gallagher:

Is this Thio-tepa over a long term course?

Dr. Hill:

The only way we give Thio-tepa here is in weekly doses. We may start with intra-cavity or intravenous therapy, but we switch to intramuscular injections if the drug is well tolerated. However, some patients don't tolerate it well intramuscularly. They have pain at local injection sites, and those patients will continue to receive it intravenously.

Dr: Huseby:

There really is no correlation between whether a patient will respond to a chemotherapeutic agent and his previous response to a hormonal agent. These seem to be totally separate, whereas there is some correlation within the group of endocrine responses. In other words, if patients do not respond to castration, they probably will not respond to adrenalectomy.

Dr. Hill:

Right. Endocrine ablative procedures were performed on fourteen patients seen in our clinic. In seven an oophorectomy was done, and five of these patients responded. Those were all done prior to our using chemotherapy. Four of the patients had adrenalectomies, and two had both oophorectomy and adrenalectomy. One had an orchiectomy. Not all of the adrenalectomies were done in patients prior to chemotherapy—two were performed after they had several courses of chemotherapy. The percentage of responders was very high. As I mentioned before, I am sure that is because patients who responded to these procedures and lived long enough to come to clinic were the ones we saw. The patients who didn't respond usually failed quickly and never were referred for chemotherapy. In general, the patients who responded to an agent showed less toxicity than those who didn't respond. This is seen in every institution in which breast cancer is treated. If the patients respond, they usually respond at a lower dose than we would push them to in order to achieve a response. For our out-patients we hold chemotherapy dosage at a level which rarely produces toxicity.

Adrenalectomy was no contraindication to chemotherapy, and two of the six adrenalectomized patients had excellent responses to 5 FU. The 5 FU brochure states that 5 FU should not be used in a patient who has been adrenalectomized. Several other institutions agree but the City of Hope Hospital has reported a large series of chemotherapy cases treated after adrenalectomy, and they—like we—find that it can be done successfully.

Dr. Huseby:

How are you doing it? Are you giving a loading dose or just the weekly dose?

Dr. Hill:

When we start an adrenalectomized patient on therapy they are usually in the hospital, and whether we use a loading dose or not depends on how they appear clinically. Our adrenalectomized patients had a loading dose with four or five daily doses of 5 FU. However, these are adrenalectomy failures—at least four of the adrenalectomized patients had exacerbations of their disease at the time

we saw them. They were pretty sick, so we had them in the hospital for about a week with intravenous fluids and a general build up, and a check of their total medical status before we started them on the loading course. This is a more cautious approach than we use in the ordinary patient starting on 5 FU.

Dr. Huseby:

Do you increase their corticoid replacement?

Dr. Hill:

Yes, we do.

Dr. Huseby:

Fine. It doesn't seem to do any good if you give the adrenalectomy patient 5 FU, and they go into crisis. It's almost impossible to pull them out of crisis by increasing their corticoids then. You have to start them on a big dose of corticoids before they get toxic.

Dr. Hill:

We found no correlations which enable us to predict in advance which patients would respond to chemotherapy. Although, as Dr. Huseby points out, if the patient responds to endocrine ablative procedure, he will probably respond to hormone manipulation and vice versa. But we did see that patients who respond to two or more agents were more likely to respond to other agents tried in sequence. We were surprised to see that estrogens were far more effective than either corticosteroids or androgens in our clinic. Estrogens produced responses in three out of six evaluable patients.

We found that fluoxymesterone was the best tolerated androgen. All patients treated with androgens were pushed to toxicity with the usual side effects of fluid retention, libido, nausea, hirsutism or polycythemia. I don't think that we were using the drugs in doses that were too low or for too short a period of time. It's just that our patients didn't respond.

Our best results have been in patients with skin, lymph node, breast or pleural metastases. The patterns of response in the seventeen responders are shown in (Table 4). Three responded to ablative procedure only. In other words they had an ablative procedure either before or after we treated them, and endocrine ablation was the only thing to which they responded. Nine responded only to chemotherapy, two to hormones only, two to surgery and chemotherapy, and one responded to everything tried.

TABLE 4

BREAST CA CHEMOTHERAPY
UCMC
7/1/67 - 3/26/70

PATTERNS OF RESPONSE IN 17 RESPONDERS

ABLATIVE SURGERY	7
CHEMOTHERAPY ONLY	5
HORMONE ONLY	2
ABLATIVE + CHEMO	2
ABLATIVE + CHEMO + HORMONE	1
	17

Dr. Huseby, would you like to make some additional comments?

Dr. Huseby:

Well, I think your numbers are too small to draw any conclusions. I'm afraid your adrenalectomies are going to catch up with you, and I hope your adrogens will catch up too. Our experience has always been that if the patient is at least five years postmenopausal, and has metastases of the lung or pleura or the soft tissues, the chances of improving her are much better with estrogen than testosterone. Our feeling, however, is still that with osseous disease we have a better chance with androgen than we do with estrogen. Now, as far as healing of bone lesions with chemotherapy, the only bone healing that we have seen with chemotherapy has either been with long term Thio-tepa or long term Methotrexate. We haven't seen it with 5 FU and as far as I can determine very few other people really see improvement of the osseous disease with this drug. When the patient has osseous disease and other disease, let's say skin, and the skin lesion disappears and the osseous disease does not progress, they call this a response. It is, but actually, it is healing of the skin, not the osseous disease.

Dr. Hill:

I think we're seeing that too in increasing amounts. Dr. Gallagher or Dr. Earley, do you have any comments on the patients prior to referral to chemotherapy clinic? You certainly see a lot more than we do, fortunately. What percentage of your patients recur here?

Dr. Gallagher:

I don't really know right now because we are just in the process of trying to gather up all of the patients we have been following over the years now. Part of the time we've never had control of these people. I think in another six months to a year we could answer that quite accurately.

Dr. Earley:

In the last three years we have had thirty radical mastectomies that are being followed, and we are in the process of bringing records of the past fifteen years up to date. Unfortunately, we don't have all of the information available yet!

Dr. Hill:

Dr. Johnson, would you like to make any comments about the treatment of male breast cancer?

Dr. Johnson:

I've seen two men with this particular problem, and the approach is exactly the same as described in this patient. Both of these men subsequently had orchiectomies with good response.

Dr. Hill:

Thank you all for coming and participating. •

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Problems of rubella vaccination in adult women*

James J. Delaney, MD, Denver

Practical suggestion for handling of a vital and current problem.

IT IS COMMON KNOWLEDGE that the principal clinical significance of Rubella is its occurrence in a woman during the early part of her pregnancy. The primary reason for concern is the possibility that a child will be born with the well-known sequelae of fetal infection. The incidence of an involved fetus may be as low as 10 per cent or as high as 90 per cent, depending on when the infection occurred and which authority one quotes. There are so many variables in studying the results of such pregnancies that statistics are difficult to evaluate. Regardless of the lack of valid statistics, there is no doubt that maternal rubella infection can result in an infected infant which may die in utero, be born with severe congenital anomalies, or be born with minimal congenital anomalies or no obvious sequelae. Until eradication of the disease becomes a reality, we will continue to be confronted with the problem of rubella in pregnancy.

The licensing of a rubella vaccine is supposed to be the beginning of the end of this problem, but in the meantime, the availability of the vaccine will raise some new problems. We have received several inquiries about the use and misuse of the vaccine in adults. The purpose of this article is to point out the problems of vaccination and answer some of the more commonly asked questions.

*From the Department of Obstetrics and Gynecology, University of Colorado Medical Center, Denver, Colo. Dr. Delaney is Asst. Professor.

Vaccine Development

The history and current status of rubella infections and research has been well reviewed by Cooper.[1,2] The rubella virus was first cultured in 1962 enabling virologists to begin work on a vaccine. Killed virus preparations proved unsatisfactory as a source for an effective vaccine. Efforts were then directed toward the production of a safe live virus vaccine. Such a vaccine must have three characteristics. First, it must be effective at providing long-lasting immunity. Second, it must not be communicable, that is, vaccinated individuals must not be able to infect rubella susceptible contacts. Third, it must be free of undesirable side effects. Using several parameters to evaluate virulence, several strains of virus have been attenuated by serial passage through tissue culture media. Vaccines have been subsequently produced using these attenuated viruses and clinical field trials have been carried on throughout the world.

There are basically three strains of virus used in the manufacture of vaccine—HPV-77, Cendehill and RA 27/3. Licenses have been issued and vaccines are available from Merck, Parke Davis and Philips Roxane. All three of these are HPV-77 vaccines. Smith, Kline and French has produced a vaccine using the Cendehill strain which has also been licensed and Burrough's Wellcome has a vaccine using the RA 27/3 strain which, although not available in this country yet, has been used in England.

All three strains appear to produce immunity in more than 90 per cent of rubella susceptible vaccinated subjects. The duration

of immunity must be evaluated through the years since attenuated virus vaccines tend to produce less than maximum antibody responses. Extensive closed field trials have shown virtually no cross infection to non-vaccinated susceptible individuals living in the same environment.

Safety

In children, clinical trials originally reported practically no side effects resulting from vaccination. However, recent mass vaccination programs have demonstrated side effects in approximately 5 per cent of those children who have been vaccinated. Adult men, only a few of whom have been tested, have had virtually no side effects. Adult women have not been so fortunate—they have experienced a significant incidence of morbidity following vaccination. The morbidity is similar to that seen in the natural occurring disease in adults, namely fever, rash, malaise, anorexia, other gastrointestinal complaints, adenopathy, arthralgia, arthritis and rarely encephalitis. The joint problems seem to be the most significant complications and seem to be more prevalent and severe in the HPV-77 vaccines.[3,4] The Cendehill vaccine has an incidence of 8.1 per cent joint problems in 432 women studied with 6.9 per cent (30) having arthralgia and 1.2 per cent[3] having arthritis. In 95 women vaccinated with HPV-77 vaccines, the incidence of joint problems was 42.1 per cent. Arthralgia was present in 15.8 per cent (15) and 26.3 per cent (25) had arthritis. The high incidence of joint problems in the HPV-77 vaccines is generally confirmed by all investigators in the field.

Most of the questions we have received have been concerned with fetal risk in a pregnant woman who has been inadvertently vaccinated. The experience with such cases has been small, but I am sure will continue to grow as the vaccine becomes more readily available. A small number of rubella susceptible women scheduled to undergo termination of their pregnancies have been vaccinated and the products of conception studied. The only published report[5] included ten cases, and the virus was found in only one instance, being cultured from a kidney preparation but from no other tissue. There is some question about the handling of the fetal tissue in this case and the positive culture may represent contamination. In addition to the ten reported cases, we know of fourteen other cases in which abortions were performed or a live infant was born following vaccination and there were no fetal infections or defects. It would appear that the virus infects the placenta and perhaps the membranes but for some reason spares the fetus. The gestational age at the time of vaccination was not known in all cases but there has been some experience from as early as conception to as late as 18 weeks. The viremia from vaccination occurs approximately 10 to 14 days after vaccination, and at least one woman who was vaccinated approximately two weeks before conception subsequently was shown to have a normal infant.

Vaccination Programs

There has been some controversy over the vaccination programs planned for the United States. One group feels that the proper approach to the immediate problem is to vaccinate susceptible women of child bearing age while another group feels the best approach is to eliminate the reservoir of the natural disease by vaccinating children. The argument against the former course is primarily centered around the feasibility and risk. It is thought that only 10 to 15 per cent of women are susceptible to rubella infection and that since only the susceptible women should be vaccinated a mass screening program would be necessary to identify those who should be vaccinated. Facilities for such a program are not generally available. The problems of morbidity and risk to a fetus in an unsuspected pregnancy are of only minor concern. The critics to the childhood approach say that thousands of women will remain at risk and since the major problem is fetal infection, the primary attack should be the vaccination of the susceptible woman. We personally feel that the answer lies in doing both. The actual risk of susceptibility in the adult woman seems to depend upon

whether she lives in an urban or rural area. The risk of susceptibility in urban areas is in the range of 10 per cent while in rural areas it may be as high as 80 per cent.[4,6]

Some Practical Considerations

Who then should be vaccinated and when should it be done? The recommendations for children are simple. Any preschool child over the age of one not known to have had the disease should be vaccinated and rubella vaccination should become a part of infant immunization routines. The school age child up to puberty should also be vaccinated unless he has been known to have had the disease. Beyond adolescense, susceptibility should be determined prior to vaccination. The presence of antibody is most easily done by a hemagglutination inhibition (HI) test. In Colorado the State Health Department will do this without charge using an automated system capable of handling a volume similar to serologies. Some private laboratories run HI titres for about $15 but the reliability of the procedure should be discussed with the director before accepting the results. We consider a titre of less than 1:8 to be negative. On the basis of field trial studies we felt that in children any of the available vaccines would be safe and effective. However, based on clinical experience in mass vaccination programs in Colorado, we have seen no side effects with the Merck vaccine but considerable arthralgia with the Phillips Roxane vaccine. The other two vaccines have not been used extensively in Colorado. In adult women, we believe that it is better to use the Cendehill vaccine of Smith, Kline and French for vaccination because of the lower morbidity.

In spite of the apparent safety of vaccination during pregnancy, conclusive evidence must await further experience and pregnant women should not be vaccinated. It will remain the physician's responsibility to determine the possibility of pregnancy and to advise a woman not to become pregnant for at least one month and preferably two months after vaccination. Such advice should include counseling on how to avoid pregnancy.

Some overworked physicians have failed to determine either the rubella antibody status or the possibility of pregnancy in a woman and both seronegative and seropositive women have been vaccinated. When such cases occur, the question of whether the pregnancy should be terminated is raised. It is the author's opinion, based on existing information, that such a situation is not cause for termination of the pregnancy. This dilemma has not been limited to the overworked or shortsighted physician. We know of two instances in which a physician determined that the woman had a negative titre for rubella, had a normal pelvic examination and/or a negative pregnancy test and after vaccination found the patient to be pregnant. In one case, the vaccine was given during menstruation and the patient became pregnant during that cycle.

Comment

One final note of interest is that the rubella virus seems to be unique. There is no general agreement as to what major group of viruses it belongs, although it has some characteristics of an arbor-virus. There seems to be only one type. Nevertheless, rubella infection in Japan is not the same disease that we see in the United States or elsewhere in most of the world. In spite of widespread infection, congenital rubella is a rare disease in Japan, and even more interesting is the fact that susceptibility in adults is comparable to that in the United States as measured by the presence of antibody.

The incidence of side effects seems to be related to the virulence of the virus in the vaccine. The more virulent vaccines produce a better antibody response and therefore, possibly more lasting immunity. However, because of the very significant morbidity associated with the side effects we feel it is better to give up some degree of immunity to eliminate the side effects, especially in adult women.

We would hope that now that we have the availability of mass screening and an effective vaccine that we never learn any more about congenital rubella than we already know. The antibody status of all adult women should be determined and susceptible women vaccinated, preferably with the Cendehill

vaccine. Routine screening should be part of any initial examination whether it is a premarital examination, a prenatal examination, employment examination or just a yearly physical.

Summary

1. A brief background on the development of rubella vaccines is presented.

2. The risks associated with rubella vaccination are pointed out with emphasis on the morbidity in adult females.

3. Recommendations regarding the selection and vaccination of individuals are made. •

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RUBELLA VACCINE

The first license in the U.S. for the production of rubella (German measles) vaccine was issued this summer. Other licenses are expected to follow shortly. The vaccination program will be initially aimed at children in kindergarten and early elementary grades, as they are commonly the major source of spread of the virus in a community.

NSPB and its state affiliates are planning active backing for community rubella control programs—primarily motivated by the large incidence of congenital cataracts and other eye defects which occur in infants whose mothers contracted rubella during pregnancy. Action is imperative: Medical scientists state that, according to the cyclic nature of rubella outbreaks, an epidemic would occur in late 1970 or early 1971.

Credit: *News*, Volume 1, Number 4, National Society for The Prevention of Blindness, Inc.

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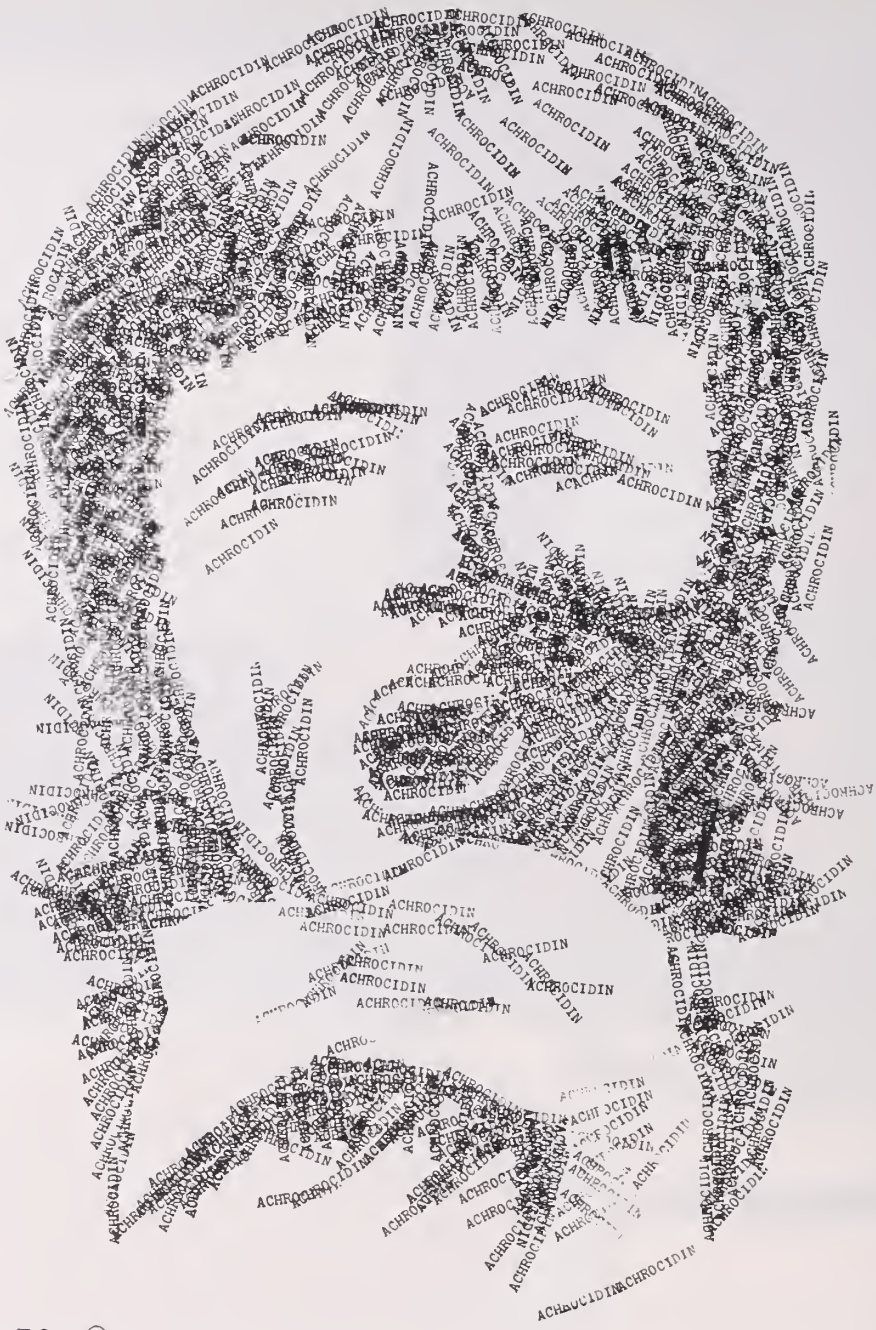

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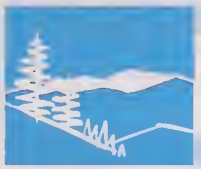

COLORADO

Denver Computer to Interpret Alamosa Hospital's Electrocardiograms

A medically inclined computer in Denver, the only one of its type in the Rocky Mountain area and one of few such systems in the nation, will begin interpreting electrocardiograms (EKGs) for physicians at Community Hospital in Alamosa, more than 200 miles southwest of Denver in the San Luis Valley. All of the hospital's 100 beds will have access via long distance telephone lines to the Community Electrocardiographic Interpretive Service (CEIS) located at St. Luke's Hospital in the Mile High City.

CEIS has been operating at St. Luke's since last December under the direction of Robert V. Elliott, MD, hospital cardiologist and coordinator of the computer operation. St. Luke's and Presbyterian Medical Center in Denver are using the system and other metropolitan hospitals will join in the near future.

The Alamosa tie-in will be the first trial of CEIS outside the Denver area. The trial project is being supported by the Colorado-Wyoming Regional Medical Program (CWRMP) to determine if community hospitals in Colorado and surrounding states which do not have full-time cardiologists can effectively use the system. Sherman D. Nichols, MD, Alamosa physician, will coordinate the tie-in at Community Hospital.

CEIS is the brainchild of Robert S. Liggett, MD, of Denver who began working on the system in 1967. The center was originally funded by a $227,000 contract from the Health Care Technology Division of the National Center for Health Services Research and Development, U.S. Department of Health, Education and Welfare.

THE COLORADO SOCIETY, the only NSPB affiliate which participates in an eye bank program, reports that this year's score for the Colorado Eye Bank was 726 new donor forms (total inventory: 11,000 donor forms on file). Eye bank donors made possible 84 corneal transplants during the year. Surgical director of the Colorado Eye Bank is Morris Kaplan, a CSPB board member who also serves as president of the Eye Bank Association of America.

Credit: *News,* Volume 1, Number 4, National Society for The Prevention of Blindness, Inc.

MEDICAL SCHOOL NOTES

University of Colorado Medical Center

The Regents of the University of Colorado established a new medical student loan fund designed to recruit future doctors for the physician-poor counties of Colorado.

The Regents approved the creation of a *Colorado Loan Fund for Medical Students* with repayment provisions under which 30 per cent of a loan would be cancelled for each year the young doctor practices in a physician-shortage area of the state. At present there are 22 counties in Colorado which are designated as physician-shortage areas by the U.S. Public Health Service.

Loan funds for medical students are urgently needed because of severe cutbacks in federal loan assistance, increasing enrollments in the medical school, and the higher percentage of students needing assistance. Federal loan money under the Health Professions Student Loan Program has dropped from $168,000 in 1968-69 to $65,000 for the coming 1970-71 academic year.

The federal student loan program offers a 15 per cent per year cancellation of debt for each year a doctor practices in any physician-shortage area of the United States. The federal loans carry a low interest rate of 3 per cent per year, and repayment at a rate of one-tenth of the balance per year can be deferred until a student has completed military service, internship and residency, or a maximum of five years after graduation from medical school.

Similar provisions will be incorporated in the loans to be made by the new *Colorado Loan Fund,* except that the cancellation rate will be doubled to 30 per cent per year of practice in a Colorado physician-poor county. The Colorado fund is being inagurated with an initial allocation of $10,000, a portion of which will come from unrestricted gifts received from alumni and gifts to the American Medical Assn. Education and Research Foundation, which makes an annual distribution to the medical schools of the country. Earlier this year, the AMA-ERF distributed $9,913 to the CU medical school.

It is hoped that establishment of the new Colorado loan plan will increase the flow of contributions to the medical school from its alumni and friends, private foundations and corporations, and other individuals interested in the advancement of medical education and the alleviation of medical care shortages in many rural areas.

The new loan program carries the enthusiastic support of the board of directors of the Colorado Medical Fund, an organization of Colorado physicians, principally alumni of the school, which encourages financial support for the school.

* * * * *

The University of Colorado has received a $44,475 grant from the National Institute of Mental Health to continue a study of the epidemiology of accidental injury and death among the Papago Indians of Southern Arizona. Accidental death and injury among American Indians constitutes a unique mental health problem, with Indian death rates from accidents three times higher than that among the general population. In 1953 accidents became the leading cause of death among the Indians.

CU studies are in cooperation with the Indian Health Service research facility at Tucson, and they include field investigations to discover untreated and unreported cases of accidental injury and death.

University of Nevada School of Medical Sciences

A group of Reno physicians have given $25,000 to the School of Medical Sciences at the University of Nevada, Reno, in memory of the late Lawrence A. Parsons, MD.

The gift—$5,000 a year for five years—is from the Physicians' Consulting Laboratories of Reno, composed of seven pathologists. They are V. A. Salvadorini, president; John W. Callister, James W. Decker, Thomas E. Hall, Anton P. Sohn, James M. Tenney and Fred A. Laubscher. The physicians said the gift is to establish the Dr. Lawrence A. Parsons Memorial Chair of Pathology, the first chair in the School of Medical Sciences.

Dr. Parsons, who was Nevada's first pathologist, came to St. Mary's Hospital in Reno in 1933, and was also pathologist at Washoe Medical Center. He died in 1966.

* * * * *

James A. Wilkerson III, MD, formerly of the University of Utah Medical Center at Salt Lake City, has joined the faculty of the School of Medical Sciences at the University of Nevada, Reno as associate professor of pathology.

Dr. Wilkerson, 35, was assistant professor of pathology at the University Medical Center, and chief of laboratory service for the Veterans Administration Hospital at Salt Lake City. He also organized and directed the Intermountain Surgical Pathology Tissue Registry at Salt Lake City with its postgraduate education program for pathologists in Utah, Idaho, Wyoming, Montana and Nevada.

Dr. Wilkerson was born in Rock Hill, S.C., and earned his B.A. at Erskine College in South Carolina.

He holds his M.D. degree from the Johns Hopkins University School of Medicine, Baltimore, Md., and did postdoctoral work in pathology research at the University of California at Los Angeles Medical Center.

Dr. Wilkerson is editor of *"Medicine for Mountaineering,"* a book published by the Mountaineers of Seattle, Wash., in 1967.

OBITUARIES

Colorado

John F. Harrington, MD, retired Denver physician, died August 31, 1970 in the Beverly Manor Nursing Home. He was 62.

Born July 4, 1908 in Butte, Montana, Doctor Harrington attended Carrol College, Helena, Montana and the Creighton Medical School, Omaha, Nebraska.

Doctor Harrington was a member of the American Medical Association, the Colorado Medical Society, the Founding American College of Surgeons, was president of the Catholic Physicians Guild and was a member of the faculty at St. Thomas Seminary.

He is survived by his wife, Claire; two sons, the Reverend Robert M. Harrington of Grand Lake and Dr. John F. Harrington, Jr., of Denver; two daughters, Mrs. James M. Rhodes, Jr., and Mrs. James E. Bruce, both of Denver; and nine grandchildren.

* * * * *

Whitney Clair Porter, MD, Denver ophthalmologist, died at his home August 25, 1970. He was 73.

Doctor Porter was born in Indianapolis, on August 19, 1897. After completing his early education in the public schools of Indianapolis, Doctor Porter attended Wabash College, Crawfordsville, Indiana, from which he received the degree of Bachelor of Arts in 1921. He served with the American Expeditionary Forces engaged in World War I, from June, 1917, to May, 1919; returning to Wabash College upon his discharge. Doctor Porter entered the University of Colorado School of Medicine, from which he was graduated in 1926 with the degree of Doctor of Medicine. For the next eighteen months he was an intern at the Denver General Hospital, following which he began a general practice at Victor, Colorado. However, determined to specialize in ophthalmology, he gave up this practice to go to the University of Pennsylvania, where he spent a year in special study of the functions, structure, and diseases of the eye. He spent another two years at the State of Iowa University, Iowa City, in similar postgraduate study.

Returning to Colorado in 1933, after he had been certified as a Diplomate of the American Board of Ophthalmology, Doctor Porter established himself in practice in Denver, specializing exclusively in disease of the eye. By the time the United States entered World War II, he had acquired considerable renown as an oculist. Offering his services, he was commissioned a major in the Medical Corps in 1942 and until 1946 was chief of the eye, ear, nose and throat section of General Hospital, No. 8. Upon resuming his practice in

Denver in 1946, he was appointed an instructor in ophthalmology at the University of Colorado School of Medicine. He was also senior consultant in ophthalmology at the Veterans' Administration Hospital at Fort Logan, and on the staffs of Mercy, Denver General, Colorado General, and Children's hospitals.

Doctor Porter was a member of the Denver Medical Society of the Colorado Medical Society, the American Medical Association, the Colorado Ophthalmalogical Society, and the American Academy of Ophthalmology and Otolaryngology.

Doctor Porter is survived by his wife, Sarah Jane; a daughter Mrs. William S. Cole, Denver; a son Allen, of Sunnyvale, Calif., and 5 grandchildren.

Montana

Harold William Gregg, MD, died in Butte on August 1, 1970. Doctor Gregg was born in Longmont, Colorado, May 20, 1892. He received his M.A. degree from Colorado College in 1916 and his M.D. degree from the University of Colorado School of Medicine in 1920. Shortly thereafter he was appointed to the staff of the Murray Hospital in Butte. Doctor Gregg continued the practice of medicine in Butte until his retirement in 1968.

Doctor Gregg was especially active in the affairs of the Montana Medical Association. He served as a member of many of its committees and during the 1940-41 administrative year, as president of the Montana Medical Association. Doctor Gregg was a fellow of the American College of Physicians and served as governor of the Montana-Wyoming Region for the college for many years. He was also interested in the activities of the Montana Heart Association and served as a member of its Board of Directors for many years.

* * * * *

Lawrence G. Dunlap, MD, died in Springfield, Illinois August 12, 1970 at the age of 78.

Doctor Dunlap had lived and practiced as an eye, ear, nose and throat specialist in Anaconda, Montana for nearly 50 years before retiring and moving to Springfield.

He is survived by his wife, Mabel; a daughter, Mrs. Charles Foltz of Seattle; three sons, Dr. Lawrence Dunlap, of Fairbanks, Alaska, Benjamin Charles Dunlap, Oahu, Hawaii, and Dr. James Dunlap, Missoula, Montana; nine granddaughters, five grandsons, and one great grandson.

Wyoming

Reuben J. Boesel, MD, of Cheyenne, Wyoming, a fellow in surgery in the Mayo Graduate School of Medicine, Rochester, Minnesota, from 1927 to 1930, died in Cheyenne on August 8, 1970.

Doctor Boesel was born in New Bremen, Ohio on April 22, 1895. He was graduated from the New Bremen High School in 1914, and subsequently enrolled in the Ohio State University where he received his Bachelor of Arts degree in 1918 and his Doctor of Medicine degree in 1921. From May, 1920, to June, 1921, he was an intern in hospitals in New York City. From 1922 to 1925 he practiced in Carbondale, Ohio, and from 1925 to 1927 he was associated with Dr. William A. Bunten in general practice in Ten Sleep and Worland, Wyoming.

Doctor Boesel came to Rochester, Minnesota, in 1927, as a fellow in surgery in the Mayo Graduate School of Medicine. His graduate sequence was concentrated on general medical and surgical diagnosis, surgical pathology, medical hospital service, proctology, neurologic surgery and surgery. He left the Mayo Graduate School of Medicine in July, 1930, to become associated with Dr. Louis P. Good and Dr. George W. Parson at Texarkana, Arkansas. In the same year he returned to Cheyenne, where he remained until his death.

In Cheyenne, Doctor Boesel was a member of the staffs of the DePaul Hospital and the Memorial Hospital of Laramie County. He had been a fellow of the American College of Surgeons since 1935, was a member of the American Medical Association, the Wyoming State Medical Society, the Industrial Medical Association, and the Alpha Kappa Kappa professional medical fraternity.

Doctor Boesel is survived by his wife, Marion.

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Pediatric Neurology Workshop
December 11, 1970

For more information concerning above meetings, contact J. Butterfield, M.D., Denver Children's Hospital, 1056 East 19th Avenue, Denver, Colorado 80218.

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December 8

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Missoula, Montana
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Rocky Mountain Medical Journal

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(1) Siver, R. H.: CMD, 21:109, September 1954. (2) Frykman, H. H.: Minn. Med., 38:19-27, January 1955. (3) McGivney, J.: Tex. State Jour. Med., 51:16-18, January 1955. (4) Quehl, T. M.: Jour. of Florida Acad. Gen. Prac., 15:15-16, October 1965. (5) Weekes, D. J.: NY State Jour. Med., 58:2672-2673, August 1958. (6) Ellis, S. and Spratt, J. S.: JOUR. AMER. GER. SOC., 18:410-415, May 1970.

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OUR COVER PHOTO

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This drug should be limited to the treatment of serious infections caused by gram-negative bacteria, particularly Pseudomonas aeruginosa, Proteus and other susceptible organisms, with due regard for relative antibiotic toxicity. Therefore, the drug should be considered for use against gram-negative: 1. Bacteremia; 2. Infected surgical wounds; 3. Severe soft tissue infections, including burns complicated by sepsis; 4. Respiratory tract infections; and 5. Selected cases of urinary tract infection.

CONTRAINDICATIONS GARAMYCIN Injectable is contraindicated in individuals with a history of hypersensitivity or toxic reactions to gentamicin.

WARNINGS Patients receiving treatment with GARAMYCIN should be under close clinical observation because of the toxicity associated with the use of this drug. Ototoxicity, vestibular and auditory, can occur in patients, primarily those with pre-existing renal damage, treated with GARAMYCIN Injectable, usually for longer periods or with higher doses than recommended.

GARAMYCIN Injectable is potentially nephrotoxic, and this should be kept in mind when it is used in patients with pre-existing renal impairment. Kidney function diminished by infection of the upper urinary tract may, however, improve during effective treatment with GARAMYCIN Injectable.

Concurrent administration of potentially ototoxic drugs such as streptomycin and kanamycin or of potentially nephrotoxic drugs such as polymyxin, colistin, and kanamycin with gentamicin sulfate has not been shown to afford any clinical advantages and, moreover may result in additive toxicity. Monitoring of vestibular, cochlear, and renal function will provide guidance for therapy in such cases.

PRECAUTIONS In patients with impaired renal function in whom serious infection develops, serum concentrations of the drug may rise, with consequently increased risk of ototoxicity. In these patients or in those in whom recommended dosage or duration of therapy must be exceeded as a life-saving measure, routine studies of kidney function should be performed when possible. These may be supplemented by evaluation of the vestibular and auditory function and measurement of serum concentration of the drug when feasible. Serum concentration of gentamicin should be maintained below the range of 10-12 mcg./ml. to reduce risk of ototoxicity.

Ordinarily, treatment should not be given for more than 7 to 10 days or be repeated unless required for serious infection not responsive to other agents.

As with other antibiotics, treatment with GARAMYCIN Injectable may occasionally result in overgrowth of nonsensitive organisms. If superinfection occurs, appropriate therapy is indicated.

Safety for use in pregnancy or the potential for fetal ototoxicity or nephrotoxicity have not been established. Studies in pregnant animals have not revealed teratogenic or ototoxic effects in the fetus. GARAMYCIN Injectable should not be used in pregnant patients or in women of childbearing age unless its use is deemed advisable by the physician.

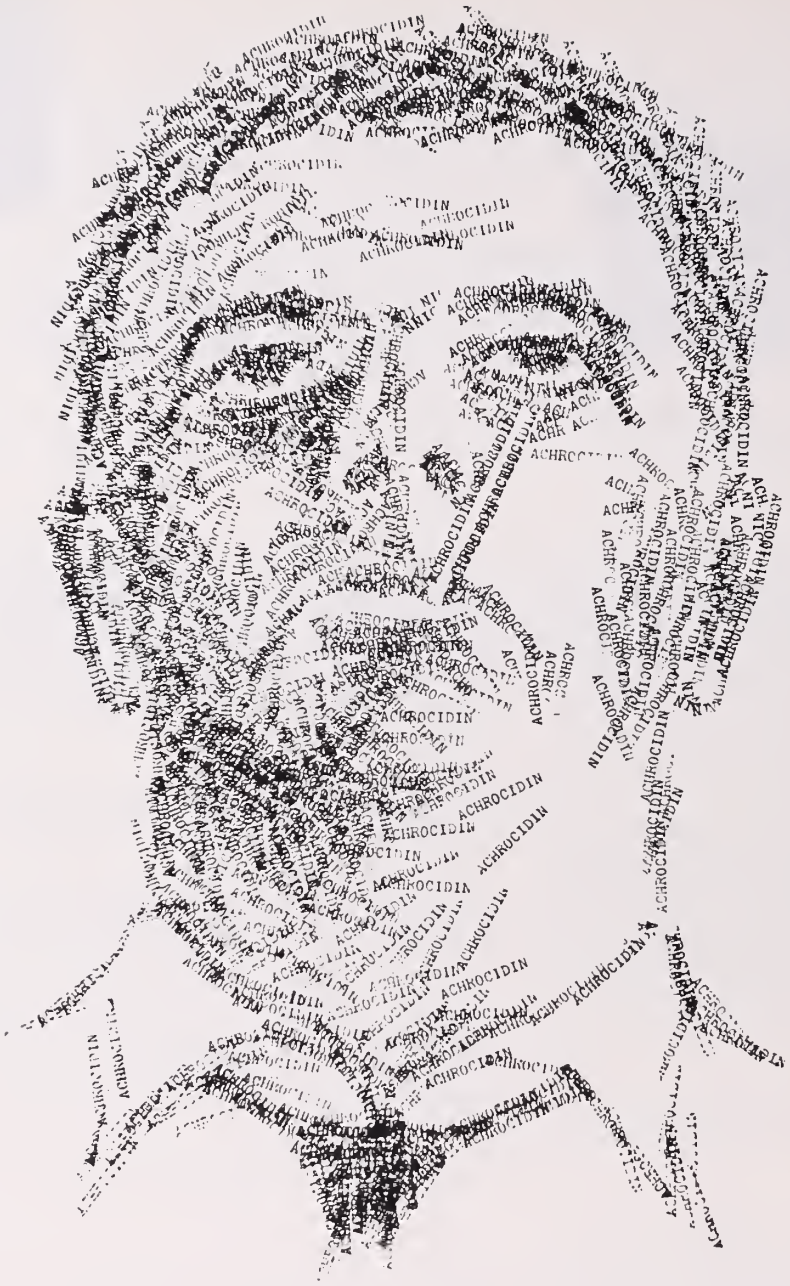
ADVERSE REACTIONS The overall incidence of ototoxicity considered related to treatment with GARAMYCIN Injectable was 2.8 per cent (16 of 565 patients). Contributory factors (two or more factors were relevant to most patients) were as follows: 10 had azotemia, 10 received a total of 1 gram or more of the drug, 7 had recently received other potentially ototoxic antibiotics (streptomycin or kanamycin), and 5 were over 60 years of age. Six also had decreased high-tone hearing acuity, which returned to or toward normal in the 4 patients retested.

Analysis of BUN data indicated that 4 (2%) of 172 patients showed increases in BUN that were probably related to treatment with GARAMYCIN Injectable. Of 20 increases probably or possibly related to treatment, 7 were reversible, 9 occurred in terminal patients, and 4 had no follow-up.

Other adverse reactions associated with treatment were one instance each of urticaria, decreased hematocrit, and reversible depression of granulocytes with normal bone marrow. Other rarely reported and possibly treatment-related adverse reactions were anemia, increased reticulocyte count, rash, purpura, drug fever, hypotension, convulsions, twitching, salivation, nausea, vomiting, increased transaminase activity (SGOT or SGPT), increased serum bilirubin, decreased serum calcium, and joint pain.

PACKAGING GARAMYCIN Injectable, 40 mg./cc., 2-cc. multiple-dose vials, for intramuscular administration.

SCHERING CORPORATION, UNION, NEW JERSEY 07083



Achrocidin® Tablets and Syrup

Tetracycline HCl—Antihistamine—Analgesic Compound

Each tablet contains: ACHROMYCIN® Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Caffeine 30 mg.; Salicylamide 150 mg.; Chlorothen Citrate 25 mg.

ACHROCIDIN Tetracycline HCl—Antihistamine—Analgesic Compound Tablets and Syrup are recommended for the treatment of tetracycline-sensitive bacterial infection which may complicate vasomotor rhinitis, sinusitis and other allergic diseases of the upper respiratory tract, and for the concomitant symptomatic relief of headache and nasal congestion. For children and elderly patients you may prefer caffeine-free ACHROCIDIN Syrup. Each 5 cc contains: ACHROMYCIN Tetracycline equivalent to Tetracycline HCl 125 mg.; Phenacetin 120 mg.; Salicylamide 150 mg.; Ascorbic Acid (C) 25 mg.; Pyrilamine Maleate 15 mg.

Contraindications: Hypersensitivity to any component.

Warning: In renal impairment, since liver toxicity is possible, lower doses are indicated; during prolonged therapy consider serum level determinations. Photodynamic reaction to sunlight may occur in hypersensitive persons. Photosensitive individuals should avoid exposure; discontinue treatment if skin discomfort occurs.

Precautions: Drowsiness, anorexia, slight gastric distress can occur. In excessive drowsiness, consider longer dosage intervals. Persons on full dosage should not operate vehicles. Nonsusceptible organisms may overgrow; treat superinfection appropriately. Treat beta-hemolytic streptococcal infections at least 10 days to help prevent rheumatic fever or acute glomerulonephritis. Tetracycline may form a stable calcium complex in bone-forming tissue and may cause dental staining during tooth development (last half of pregnancy, neonatal period, infancy, early childhood).

Adverse Reactions: *Gastrointestinal*—anorexia, nausea, vomiting, diarrhea, stomatitis, glossitis, enterocolitis, pruritus ani. *Skin*—maculopapular and erythematous rashes; exfoliative dermatitis; photosensitivity; onycholysis, nail discoloration. *Kidney*—dose-related rise in BUN. *Hypersensitivity reactions*—urticaria, angioneurotic edema, anaphylaxis. *Intracranial*—bulging fontanels in young infants. *Teeth*—yellow-brown staining; enamel hypoplasia. *Blood*—anemia, thrombocytopenic purpura, neutropenia, eosinophilia. *Liver*—cholestasis at high dosage.

Upon adverse reaction, stop medication and treat appropriately.

Lederle LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York 10965

535-9

Picture of a sprained shoulder

treated with Parafon Forte® TABLETS

Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility... stop pain-spasm feedback

by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

Prescribe PARAFON FORTE for effective spasmolysis and analgesia in sprains, strains, myalgias, low back pain, bursitis and other musculoskeletal disorders. Your patients will appreciate the restored comfort and freedom of movement it usually provides.

Contraindications: Sensitivity to either component. ***Precautions:*** Exercise caution in patients with known allergies or history of drug allergies. If a sensitivity reaction or signs or symptoms suggestive of liver dysfunction are observed, the drug should be stopped. ***Adverse Reactions:*** Occasionally, drowsiness, dizziness, lightheadedness, malaise, overstimulation or gastrointestinal disturbances may be noted; rarely, allergic-type skin rashes, petechiae, ecchymoses, angioneurotic edema or anaphylactic reactions. In rare instances, *Paraflex* (chlorzoxazone) may possibly have been associated with gastrointestinal bleeding. While *Paraflex* (chlorzoxazone) and -chlorzoxazone-containing products have been suspected as being the cause of hepatic toxicity in approximately eighteen patients, it was not possible to state that the dysfunction was or was not drug induced. ***Usual Adult Dosage:*** Two tablets q.i.d. ***Supplied:*** Scored, light green tablets, imprinted "McNEIL"—bottles of 100.

References: 1. Batterman, R. C., and Grossman, A. J.: Fed. Proc. *14*:316, 1955. 2. Goodman, L. S., and Gilman, A., ed.: The Pharmacological Basis of Therapeutics, ed. 3, New York, The Macmillan Company, 1965, p. 331. 3. Kestler, O. C., and Gyurik, J.: Industr. Med. Surg. *31*:372, 1962. 4. Forster, S., *et al.*: Amer. J. Orthop. *2*:285, 1960. 5. Friend, D. G.: Clin. Pharmacol. Ther. *5*:871, 1964.

McNEIL

McNEIL LABORATORIES, INC., FT. WASHINGTON, PA. 19034

*U.S. PATENT NO. 2,895,877

Roche announces

Efudex®

(fluorouracil) cream/solution

for the treatment of solar/actinic keratoses... a topical alternative to conventional therapy

Fluorouracil—the Roche contribution

In 1962, Roche Laboratories introduced Fluorouracil Roche® (5-fluorouracil). Early clinical work with this drug suggested that it possessed a selective cytotoxic activity when applied topically to certain kinds of lesions. Based on this work and years of clinical trials, a standardized form of topical fluorouracil can now be recommended for treatment of multiple solar or actinic keratoses.

Efudex®(fluorouracil)—a new alternative to conventional therapy

Efudex presents the physician with a topical alternative to surgery in the treatment of solar or actinic keratoses. It is effective, comparatively inexpensive and especially well-suited for treatment of multiple lesions. Important, too, is the highly desirable cosmetic result. Clinical experience demonstrates that treatment with Efudex results in an extremely low incidence of scarring.*

Highly effective on first and later applications

In clinical trials, depending on the dosage form and strength used, complete involution occurred in 77 to 88 per cent of lesions following treatment. The rate of recurrence was low, ranging from 1.7 to 5.6 per cent up to a year after completion of therapy. When lesions did recur or new ones appeared, repeated courses of Efudex therapy proved effective.*

1/22/68—Treatment with 5% 5-FU cream commences. Patient K.L. showing widespread but mild solar keratoses (also known as actinic keratoses).

2/2/68—After 11 days of treatment. Erythema is seen at site of keratoses. In addition, numerous lesions not apparent prior to therapy have become manifest by sharply defined reactions. Intervening skin, also treated, shows no response to therapy.

2/19/69—One year after cessation of therapy. Skin appears clear with no evidence of scarring. Examination reveals lack of recurrence or the formation of new lesions.

Predictable sequence of therapeutic response

Two to four weeks constitutes a typical course of Efudex therapy. The response is usually characteristic and predictable. After three or four days of treatment, erythema begins to appear in the area of the keratoses. This is followed by an intense inflammatory response, scaling and occasionally moderate tenderness or pain. The height of the inflammatory reaction generally occurs two weeks after the start of therapy, and then begins to subside as treatment is stopped. Within two weeks of discontinuing medication, the inflammation is usually gone. A mild erythema may remain for two to three months before gradually receding.

Selective—with a high degree of safety

Despite the temporary unsightliness and discomfort of the inflammatory episode, Efudex is, in general, more readily tolerated than surgery. Clinical work shows the intense inflammatory response to be limited to the area of the lesion. Normal skin is not similarly affected. Another measure of Efudex safety: systemic absorption of topical fluorouracil was insignificant, indicating a low risk of systemic toxicity.*

Two strengths—two convenient dosage forms

Efudex is available as a 2% or 5% solution or as a 5% cream. It is applied twice daily by the patient with a nonmetal applicator or suitable glove.

Before prescribing Efudex, however, there are two important considerations. First, please consult the complete prescribing information for precautions, warnings and adverse reactions. Second, advise the patient that treated lesions should respond with the characteristic but transient inflammation. A positive sign that Efudex is working for them.

*Data on file, Hoffmann-La Roche Inc., Nutley, New Jersey.

2% and 5% Solutions; 5% Cream Applied twice daily—resolves solar or actinic keratoses.

new Efudex® (fluorouracil) cream/solution

For full prescribing information, please see the following page.

Roche introduces

Efudex®

(fluorouracil) cream/solution the new standardized topical for solar/actinic keratoses

Description: Efudex solutions and cream are topical preparations containing the fluorinated pyrimidine 5-fluorouracil, an antineoplastic antimetabolite.

Efudex Solution consists of 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris-(hydroxymethyl) aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream contains 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

Actions: There is evidence that the metabolism of fluorouracil in the anabolic pathway blocks the methylation reaction of deoxyuridylic acid to thymidylic acid. In this fashion fluorouracil interferes with the synthesis of deoxyribonucleic acid (DNA) and to a lesser extent inhibits the formation of ribonucleic acid (RNA). Since DNA and RNA are essential for cell division and growth, the effect of fluorouracil may be to create a thymine deficiency which provokes unbalanced growth and death of the cell. The effects of DNA and RNA deprivation are most marked on those cells which grow more rapidly and which take up fluorouracil at a more rapid pace. The catabolic metabolism of fluorouracil results in degradative products (*e.g.*, CO_2, urea, α-fluoro-β-alanine) which are inactive.

Studies in man with topical application of ^{14}C-labeled Efudex demonstrated insignificant absorption as measured by ^{14}C content of plasma, urine and respiratory CO_2.

Indications: Efudex is recommended for the topical treatment of multiple actinic or solar keratoses.

Contraindications: Efudex is contraindicated in patients with known hypersensitivity to any of its components.

Warnings: If an occlusive dressing is used, there may be an increase in the incidence of inflammatory reactions in the adjacent normal skin.

Prolonged exposure to ultraviolet rays should be avoided while under treatment with Efudex because the intensity of the reaction may be increased.

Usage in Pregnancy: Safety for use in pregnancy has not been established.

Precautions: If Efudex is applied with the fingers, the hands should be washed immediately afterward. Efudex should be applied with care near the eyes, nose and mouth. To rule out the presence of a frank neoplasm, a biopsy should be made of those areas failing to respond to treatment or recurring after treatment.

Adverse Reactions: The most frequently encountered local reactions were pain, pruritus, hyperpigmentation and burning at the site of application. Other local reactions included dermatitis, scarring, soreness and tenderness.

Also reported were insomnia, stomatitis, suppuration, scaling, swelling, irritability, medicinal taste, photosensitivity and lacrimation.

Laboratory abnormalities reported were leukocytosis, thrombocytopenia, toxic granulation and eosinophilia.

Dosage and Administration: Efudex should be applied twice daily with a nonmetal applicator or suitable glove in an amount of the solution or cream sufficient to cover the lesion. When Efudex is applied to a lesion, a response occurs with the following sequence: erythema, usually followed by vesiculation, erosion, ulceration, necrosis and epithelization. The lower frequency and intensity of activity in adjacent normal skin indicate a selective cytotoxic property. Medication should be continued until the inflammatory reaction reaches the erosion, necrosis and ulceration stage, at which time use of the drug should be terminated. The usual duration of therapy is from 2 to 4 weeks. Complete healing of the lesion may not be evident for 1 to 2 months following cessation of Efudex therapy.

How Supplied: Efudex Solution, 10-ml drop dispensers—containing 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris(hydroxymethyl)aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream, 25-Gm tubes—containing 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

Clinical Studies: The effectiveness of the three preparations as determined by complete involution of solar keratoses was: 2% Solution, 77% of 282 lesions; 5% Solution, 88% of 202 lesions; and 5% Cream, 85% of 189 lesions. In those lesions where complete involution followed treatment, the rate of possible recurrences observed clinically at periods up to 12 months or more was: 2% Solution, 4.6% of 218 lesions; 5% Solution, 1.7% of 177 lesions; and 5% Cream, 5.6% of 160 lesions. Because of the toxic potential of fluorouracil, some physicians preferred to use the 2% solution when large areas were to be treated. Approximately 30% of the lesions required treatment for two weeks or less; approximately 78% required four weeks or less for adequate treatment.

ROCHE Roche LABORATORIES
Division of Hoffmann-La Roche Inc.
Nutley, New Jersey 07110

The pain of arthritis

relieved with MEASURIN® q. 8h. dosage

Double-strength Measurin timed-release aspirin offers a new kind of control for your arthritic patients. Each 10-grain tablet has over 6,000 microscopic reservoirs that release aspirin at a controlled rate—some right away and some later on. This means—fast relief, followed by long lasting relief. Throughout the day, Measurin gives your patients freedom from a 4-hour dosage schedule. Measurin can help your patients get a good night's sleep, uninterrupted by the need for an extra dose of aspirin. And, taken at bedtime, it also helps ease morning joint discomfort and stiffness.

For Professional Samples write:
Breon Laboratories Inc.
Sample Fulfillment Division
P.O. Box 141
Fairview, N.J. 07022

BREON

BREON LABORATORIES INC.
90 Park Avenue, New York, N.Y. 10016
Subsidiary of Sterling Drug Inc.

MEASURIN®
TIMED-RELEASE ASPIRIN

ECONOMICAL • EFFECTIVE • LONG LASTING PAIN RELIEF

Dosage: 2 tablets followed by 1 or 2 tablets every 8 hours as required, not to exceed 6 tablets in 24 hours. For maximum nighttime pain relief and to help relieve early morning stiffness, 2 tablets at bedtime.

Available: Bottles of 12, 36 and 60 tablets.

"For all the happiness mankind can gain It is not in pleasure, but in rest from pain."

John Dryden

Give your patients rest from pain

Empirin® Compound with Codeine Phosphate gr. 1/2, No. 3

Each tablet contains: Codeine Phosphate gr. ½ (Warning—May be habit forming), Phenacetin gr. 2½, Aspirin gr. 3½, Caffeine gr. ½.

B. W. & Co. narcotic products are Class "B", and as such are available on oral prescription, where State law permits.

Complete literature available on request from Professional Services Dept. PML.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N.Y.

The girth control pill

Tepanil® Ten-tab

(continuous release form)

(diethylpropion hydrochloride)

works on the appetite not on the 'nerves'

When girth gets out of control, TEPANIL can provide sound support for the weight control program you recommend. TEPANIL reduces the appetite—patients enjoy food but eat less. Weight loss is significant—gradual—yet there is a relatively low incidence of CNS stimulation.

Contraindications: Concurrently with MAO inhibitors, in patients hypersensitive to this drug; in emotionally unstable patients susceptible to drug abuse.

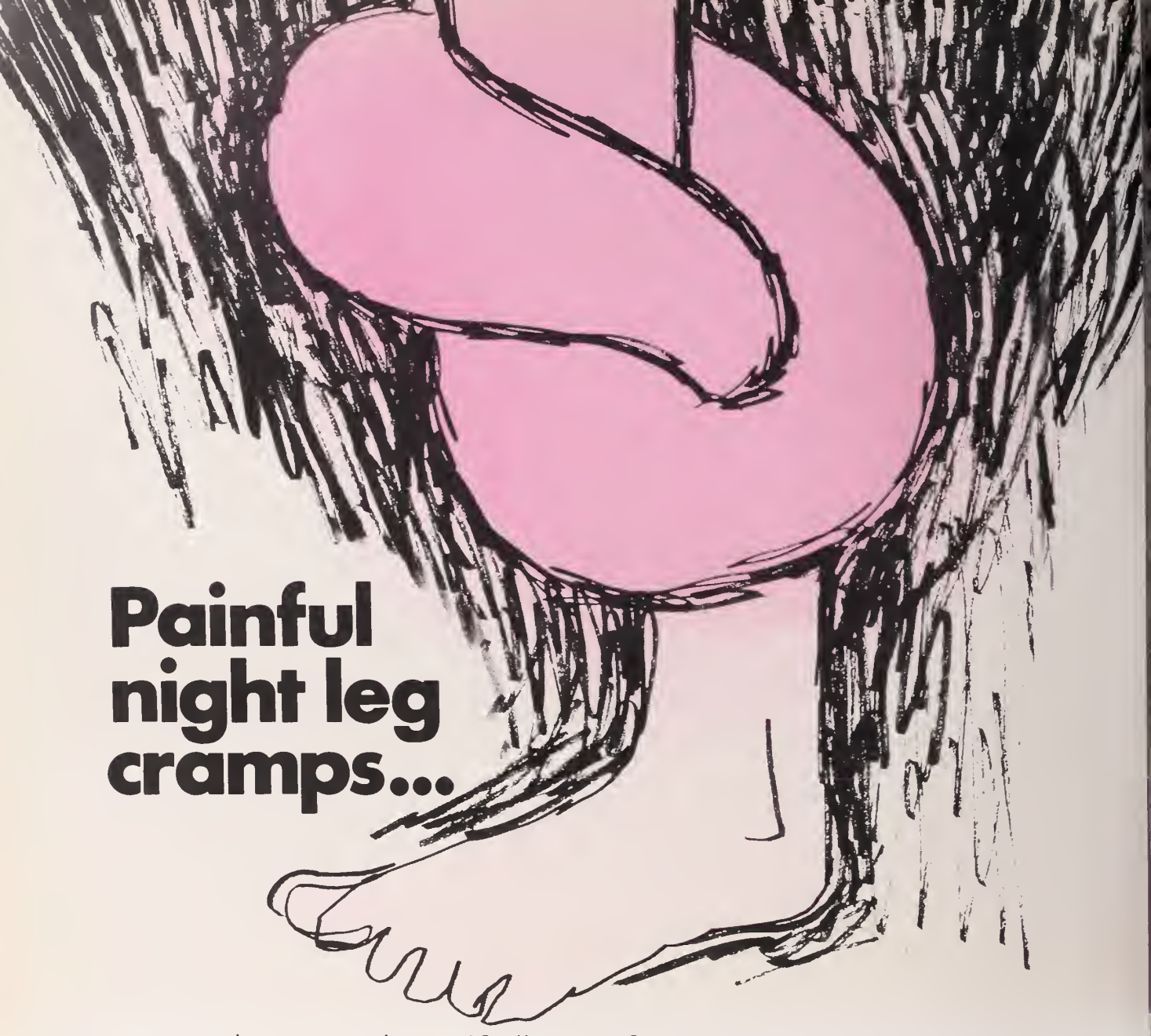
Warning: Although generally safer than the amphetamines, use with great caution in patients with severe hypertension or severe cardiovascular disease. Do not use during first trimester of pregnancy unless potential benefits outweigh potential risks.

Adverse Reactions: Rarely severe enough to require discontinuation of therapy, unpleasant symptoms with diethylpropion hydrochloride have been reported to occur in relatively low incidence. As is characteristic of sympathomimetic agents, it may occasionally cause CNS effects such as insomnia, nervousness, dizziness, anxiety, and jitteriness. In contrast, CNS depression has been reported. In a few epileptics an increase in convulsive episodes has been reported. Sympathomimetic cardiovascular effects reported include ones such as tachycardia, precordial pain, arrhythmia, palpitation, and increased blood pressure. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride; this was an isolated experience, which has not been reported by others. Allergic phenomena reported include such conditions as rash, urticaria, ecchymosis, and erythema. Gastrointestinal effects such as diarrhea, constipation, nausea, vomiting, and abdominal discomfort have been reported. Specific reports on the hematopoietic system include two each of bone marrow depression, agranulocytosis, and leukopenia. A variety of miscellaneous adverse reactions have been reported by physicians. These include complaints such as dry mouth, headache, dyspnea, menstrual upset, hair loss, muscle pain, decreased libido, dysuria, and polyuria.

Convenience of two dosage forms: TEPANIL Ten-tab tablets: One 75 mg. tablet daily, swallowed whole, in midmorning (10 a.m.); TEPANIL: One 25 mg. tablet three times daily, one hour before meals. If desired, an additional tablet may be given in midevening to overcome night hunger. Use in children under 12 years of age is not recommended.

T-006A / 1/70 / U.S. PATENT NO. 3,001,910

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144



Painful night leg cramps...

unwelcome bedfellow for any patient– including those with arthritis, diabetes or PVD

One thing patients can sleep without, particularly patients with chronic disease conditions such as arthritis, diabetes or PVD, is painful night leg cramps. Although seldom the presenting complaint, night leg cramps can tie your patients up in painful knots. Now, just one tablet of QUINAMM at bedtime can usually bring an end to shattered sleep and needless suffering. Your patients will sleep restfully—gratefully—with QUINAMM, specific therapy to prevent painful night leg cramps.

Prescribing Information—Composition: Each white, beveled, compressed tablet contains: Quinine sulfate, 260 mg., Aminophylline, 195 mg. **Indications:** For the prevention and treatment of nocturnal and recumbency leg muscle cramps, including those associated with arthritis, diabetes, varicose veins, thrambaphlebitis, arteriosclerosis and static foot deformities. **Contraindications:** QUINAMM is contraindicated in pregnancy because of its quinine content. **Precautions/Adverse Reactions:** Aminophylline may produce intestinal cramps in some instances, and quinine may produce symptoms of cinchonism, such as tinnitus, dizziness, and gastrointestinal disturbance. Discontinue use if ringing in the ears, deafness, skin rash, or visual disturbances occur. **Dosage:** One tablet upon retiring. Where necessary, dosage may be increased to one tablet following the evening meal and one tablet upon retiring. **Supplied:** Bottles of 100 and 500 tablets.

THE NATIONAL DRUG COMPANY
DIVISION OF RICHARDSON-MERRELL INC.
PHILADELPHIA, PENNSYLVANIA 19144

Quinamm™
(quinine sulfate 260 mg., aminophylline 195 mg.)

Specific therapy for night leg cramps

Drip stopped, Congestion cleared

For upper respiratory allergies and infections, up to 12 hours clear breathing on one tablet. Dimetapp Extentabs® do an outstanding job of helping clear up the stuffiness, drip and congestion of colds and upper respiratory allergies and infections. Each Extentab keeps working up to 12 hours. And for most patients drowsiness or overstimulation is unlikely.

INDICATIONS: Dimetapp is indicated for symptomatic relief of the allergic manifestations of respiratory illnesses, such as the common cold and bronchial asthma, seasonal allergies, rhinitis, conjunctivitis, and otitis. CONTRAINDICATIONS: Hypersensitivity to antihistamines. Not recommended for use during pregnancy. PRECAUTIONS: Until patient's response has been determined, he should be cautioned against engaging in operations requiring alertness. Administer with care to patients with cardiac or peripheral vascular diseases or hypertension. SIDE EFFECTS: Hypersensitivity reactions including skin rashes, urticaria, hypotension and thrombocytopenia, have been reported on rare occasions. Drowsiness, lassitude, nausea, giddiness, dryness of the mouth, mydriasis, increased irritability or excitement may be encountered. DOSAGE: 1 Extentab morning and evening. SUPPLIED: Bottles of 100 and 500.

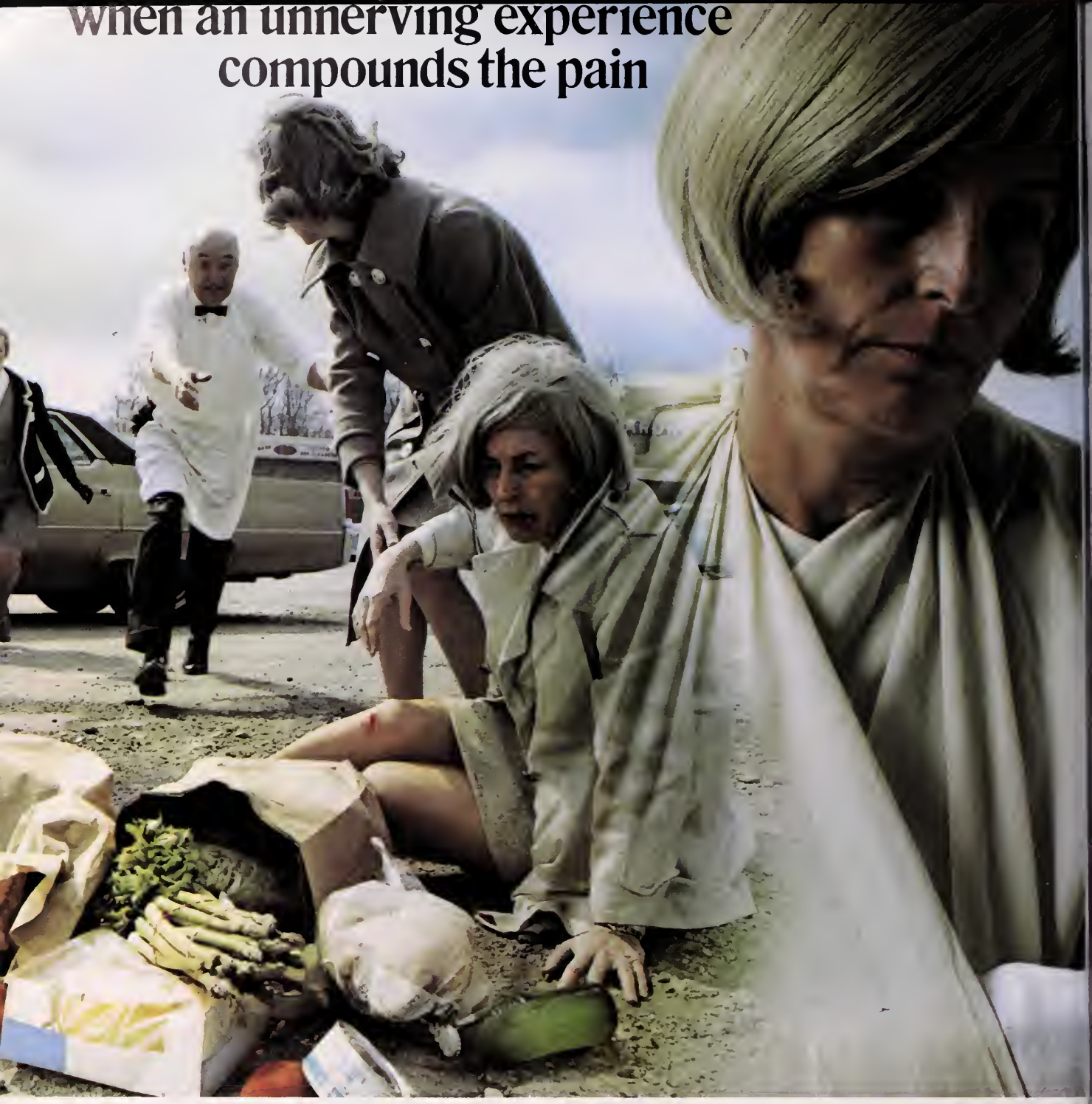
A·H·ROBINS

A. H. Robins Company
Richmond, Va 23220

Dimetapp® Extentabs

Dimetane® (brompheniramine maleate), 12 mg.; phenylephrine HCl, 15 mg.; phenylpropanolamine HCl, 15 mg.

when an unnerving experience compounds the pain



the compound analgesic that calms instead of caffeinates

In addition to pain, this patient has experienced anxiety, fear, embarrassment, and frustration. No doubt these psychic factors actually increased her perception of pain. Surely the last thing she needs is an analgesic containing caffeine. The logical choice is Phenaphen with Codeine. It provides a quarter grain of phenobarbital to take the nervous "edge" off, so the rest of the formula can control the pain more effectively. It's no accident that the Phenaphen formulations contain a sedative rather than a stimulant. Don't you agree, Doctor, that psychic overlay is an important factor in most of the accident cases you see?

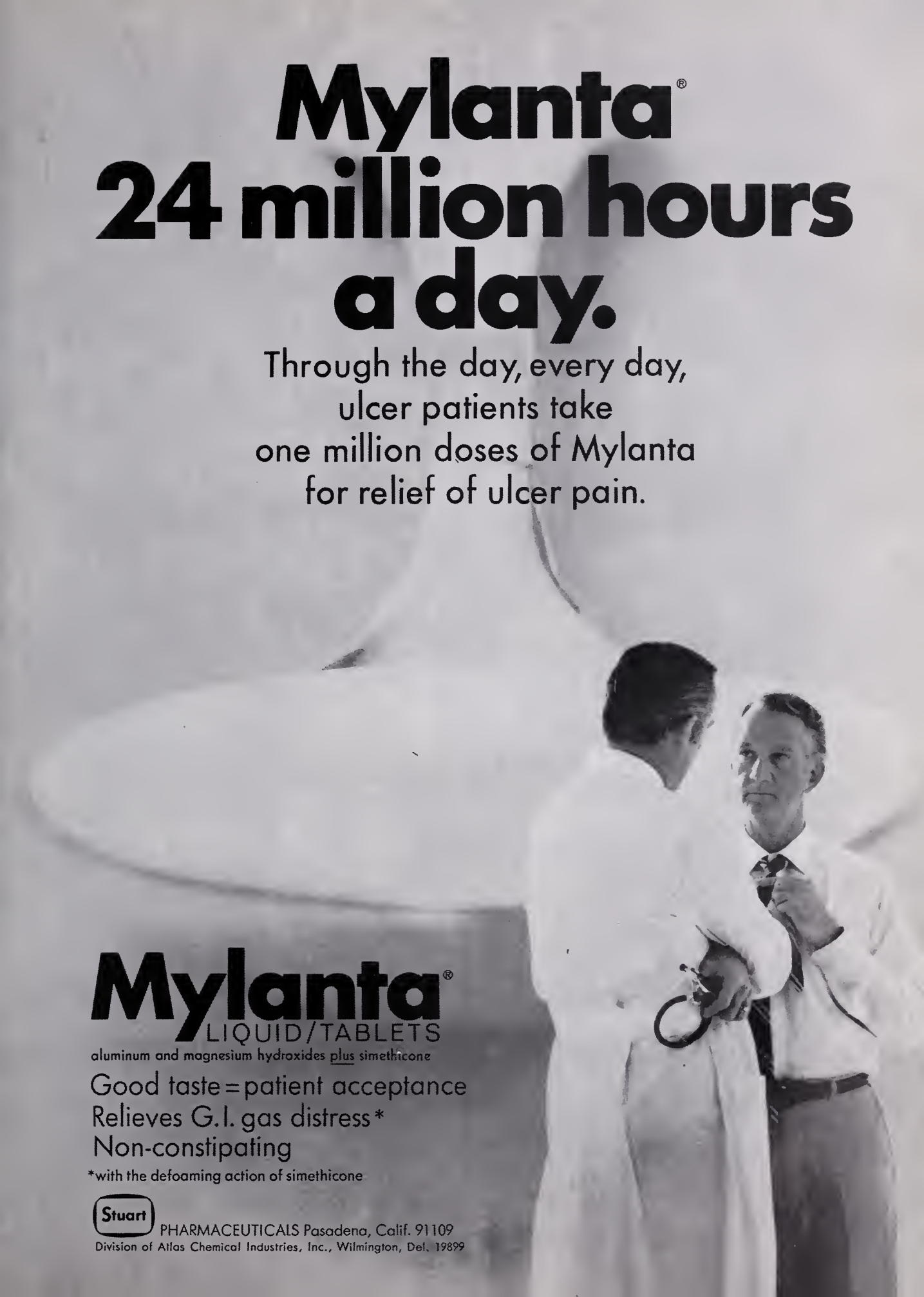
Phenaphen®
with Codeine

Phenaphen with Codeine Nos. 2, 3, or 4 contains: Phenobarbital (¼ gr.), 16.2 mg. (warning: may be habit forming); Aspirin (2½ gr.), 162.0 mg.; Phenacetin (3 gr.), 194.0 mg.; Hyoscyamine sulfate, 0.031 mg.; Codeine phosphate, ¼ gr. (No. 2), ½ gr. (No. 3), or 1 gr. (No. 4) (warning: may be habit forming). **Indications:** Provides relief in severer grades of pain, on low codeine dosage, with minimal possibility of side effects. Its use frequently makes unnecessary the use of addicting narcotics. **Contraindications:** Hypersensitivity to any of the components. **Precautions:** As with all phenacetin-containing products, excessive or prolonged use should be avoided. **Side effects:** Side effects are uncommon, although nausea, constipation and drowsiness may occur. **Dosage:** Phenaphen No. 2 and No. 3—1 or 2 capsules every 3 to 4 hours as needed; Phenaphen No. 4—1 capsule every 3 to 4 hours as needed. For further details see product literature.
A. H. Robins Company, Richmond, Va.

A·H·ROBINS

Mylanta®
24 million hours a day.

Through the day, every day,
ulcer patients take
one million doses of Mylanta
for relief of ulcer pain.



Mylanta®
LIQUID/TABLETS
aluminum and magnesium hydroxides plus simethicone

Good taste = patient acceptance
Relieves G.I. gas distress*
Non-constipating

*with the defoaming action of simethicone

Stuart PHARMACEUTICALS Pasadena, Calif. 91109
Division of Atlas Chemical Industries, Inc., Wilmington, Del. 19899

Each 5 cc. contain erythromycin estolate equivalent to 250 mg. erythromycin base.
When mixed as directed, each 5 cc. will contain erythromycin estolate equivalent to 125 mg. erythromycin base.
When mixed as directed, each cc. will contain erythromycin estolate equivalent to 100 mg. erythromycin base.
Each 5 cc. contain erythromycin estolate equivalent to 125 mg. erythromycin base.
Each tablet contains erythromycin estolate equivalent to 125 mg. erythromycin base.
Each Pulvule® contains erythromycin estolate equivalent to 125 mg. erythromycin base.
Each Pulvule contains erythromycin estolate equivalent to 250 mg. erythromycin base.
The many forms of Ilosone®
Erythromycin Estolate
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900761

HAVING RECENTLY celebrated his 75th birthday anniversary, Dr. Franklin Gessford Ebaugh has announced his proposed complete retirement from the active practice of psychiatry in the near future. His many friends and former students will greet this news with more than a little nostalgia, for he has long represented the sterling best in leadership in the field of psychiatry. His achievements are countless, reflecting always the highest levels of excellence.

Franklin Gessford Ebaugh, M.D.

During the years he served as director of Colorado Psychiatric Hospital and Professor of Psychiatry at the University of Colorado Medical Center, the psychiatric facility grew and flourished, not only in the development of treatment methods, but also in the extension of community liaisons. In private practice, he continued an active role in the elaboration of community psychiatry, with a particular focus, always, on preventive mental health, and on the whole person in context. Dr. Ebaugh's face was familiar on the professional lecture platform over the years, and his publications number in the hundreds. He has served on boards and committees with tireless concern for the actual accomplishment of goals.

The following list of awards which have been presented to him in recent years is one measure of the man:

1. THE AMERICAN PSYCHIATRIC ASSOCIATION DISTINGUISHED SERVICE AWARD—May 9, 1966
   Distinguished Member, Fellow, Life Fellow, Councilor, and Vice-President of our Association over the course of more than forty years.
2. COLORADO MEDICAL SOCIETY CITATION—September 22, 1967
   Distinguished Teacher and Innovator
3. THE THOMAS W. SALMON COMMITTEE ON PSYCHIATRY AND MENTAL HYGIENE, New York Academy of Medicine
   DISTINGUISHED SERVICE MEDAL AND CITATION—December 3, 1969
   Physician. Psychiatrist. Scholar. Educator. Scientist. Humanitarian. Frontiersman in many territories. Pioneer researcher in healing. Solid in the best traditions of classical psychiatry. Progressive in extending horizons.
4. THE BRADY FOUNDATION FOR MENTAL HEALTH ESTABLISHMENT OF EBAUGH LIBRARY AND CONFERENCE ROOM—December, 1969
   Distinguished Clinician, Educator, Counselor and Valued Friend
5. THE AMERICAN COLLEGE OF PSYCHIATRISTS E. B. BOWIS AWARD FOR 1970—May 9, 1970 (Gold Medal Award)
   For significant achievement, contributions and leadership in the field of psychiatry

Frank Ebaugh's commitment to psychiatry is quite total. If there were thirty hours in every day, he would have worked them. Yet there are other deep commitments, too, his lovely wife, Dorothy, and his fine family being chief among them. Always a formidable adversary on the golf course, he is also the dean of Rocky Mountain trout fishing. No one is quite sure how he cures his patients, but there are those who suspect that he charms them into health, for to encounter him is to experience the magnetism of a warm, mature, dedicated personality. To call him friend is an inestimable privilege.

Periodically, Frank Ebaugh says he is going to retire. Perhaps, but we wonder if he will ever quit leaving giant footprints on the sands of time!

IN EVERY ORGANIZATION the committee has often been suspect of being authorized procrastination. Recently the following report of a committee of the Colorado Medical Society was brought to our attention. "In keeping with the above thoughts, the Committee unanimously approved the suggestion that a resolution should be considered by the Council on . . . for submission to the 1970 Annual Session of the House of Delegates." The sense of the resolution follows.

What Do You Want?

The *suggestion* that a resolution *be considered* was approved—*unanimously*. That's action? Unanimous approval of indecisive motion suggests authorship by an experienced politician

However, since the report included the proposed resolution, and since this committee has a reputation for action, we conclude that the wording is an example of the unconscious verbosity characteristic of much medical writing. Elimination of reiteration and redundancy is a principal activity of the medical editor. If one word can supplant three or four, two things are accomplished — the writing is more intelligible and emphatic, and the cost of publication is reduced. "The committee unanimously approved that the following resolution be submitted to the Council on. . . ." Many words are saved, and the position of the committee is clearly on record.

"What do you want, good grammar or good taste?" There is no reason not to have both. Likewise, you can have good diction and good action.

Montana's Scientific Editor Resigns

It is with regret that we announce the resignation of Dr. Warren D. Bowman as Scientific Editor for Montana. He first became a member of the editorial staff of the *Rocky Mountain Medical Journal* in the fall of 1965, succeeding Dr. Raymond D. Grondahl of Butte, Montana. Dr. Bowman is a studious and busy man who feels that he cannot find sufficient time to serve this publication according to the high standards which he has always maintained Our regional medical publication in general, and Montana in particular, have been most fortunate to have had his assistance for nearly five years. During that time our *Journal* has improved in format and in content, and Montana has maintained a notable part of its activities and reputation at the national level. Montana's special issues, with their colorful covers, have been among the best. Much of the footwork in producing these issues has been done by its quiet and conscientious scientific editor.

It is generally known that Doctor Bowman is an internist associated with the Billings Clinic. As such, he has been well known in his specialty and a great asset to his organization. He was educated in Pennsylvania, being graduated from the University of Pennsylvania School of Medicine in 1954 and coming to Montana in 1960. The field of medicine has not commanded his entire time. He is also an avid mountain climber and has on several occasions attempted to climb the Grand Teton, near Jackson, Wyoming, in an effort to celebrate New Year's Eve atop this highest peak. In the summer of 1968, he was part of a four-man expedition that scaled Alaska's Mount McKinley. This calling must, indeed, be in his blood. One of his well-known quotations is, "There are many more mountains to climb than I have time." We hope that he can salvage enough time, when relieved of editorial responsibilities on behalf of this *Journal*, to climb an extra mountain or two.

We have heard from the President of the Montana Medical Association, Dr. Oscar Swenson, concerning Dr. Bowman's successor. He is Dr. Gerald A. Diettert of Missoula, whose special interest is cardiovascular disease. We will do our best to indoctrinate him. He will, of course, know of his important responsibilities in maintaining the standards well established by our great northwestern participating state.

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Pulmonary macrophages

*Observations of eosinophilic extracytoplasmic processes**

A preliminary report

Cyril D. Fullmer, MD and Kenneth R. Walker, B.S., C.T. (ASCP), Salt Lake City, Utah

This technical paper reports interesting and exciting new developments in the field of pulmonary cytology.

BIOPOLAR AND other unusual forms of extracytoplasmic processes have been observed in pulmonary histiocytes. The morphology and staining of these cells in the bronchial mucus is very striking. The processes take up eosin in sharp contrast to the cyanophilic staining cytoplasm. A typical example of these bipolar histiocytes is shown (Fig. 1). Note two hook-like projections on one macrophage and two bead-like mounds on opposite ends of the other. A small minority of these macrophages have only one process. However, most of these cells have two processes directly opposite each other. Others have multiple processes with at least two projections formed directly opposite each other with a few exceptions. The organization of these macrophages suggests some probable function of the processes. We are convinced that they are not artifact. The processes range in size and shape from a small bead to a large drop or a long thin bar or hook.

The cells in which these processes are found include the morphologic varieties of macrophages. They are found on macrophages with one, two, three and four nuclei as well as cells with brown or black dust particles in them. The cytoplasm stains in the typical cyanophilic or ambiphilic color.

These processes were first observed in our laboratory by one of us (Kenneth R. Walker) in November, 1968. In our search through the literature we could find no evidence of these extraordinary macrophages having been described.

In this study, 497 people were examined, 174 of whom displayed cells with these conspicuous eosinophilic processes. Although these cells are found in 35.0 per cent of the enrollees studied, they constitute an infrequent occurrence in a few cells found in a total specimen prepared on 12 slides per enrollee. Of those producing processes, 43.7 per cent produced spontaneous specimens, 43.7 per cent produced induced specimens and 12.6 per cent produced both spontaneous and

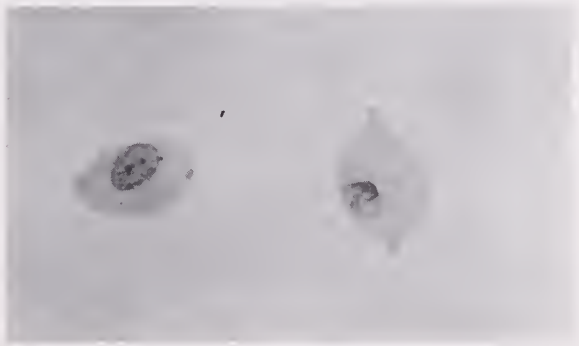

Fig. 1. Photomicrograph macrophages exhibit typical bipolar extracytoplasmic processes. These eosinophilic processes are strikingly dissimilar to the cyanophilic staining cytoplasm. Ordinary macrophages are similar to above cells without the bipolar changes. Mag. X1000.

*From the Department of Cytology, Holy Cross Hospital, Salt Lake City.

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induced specimens. It is apparent that it makes no difference whether the specimen is produced spontaneously or is induced.

Further investigation revealed that these same processes are present in some of the sputum specimens of a non-smoking control group, not included in these percentages. This rare type of histiocyte has also been found in frozen tissue sections in our laboratory.

Materials and Methods

The sputa in which these macrophages were observed as an incidental finding are from patients enrolled in a current research project where chronic cigarette smokers are studied to evaluate the practicability and accuracy of detecting early occult carcinoma. A sputum specimen is collected on three consecutive days. This is the first of five annual sputum examinations.

A cough is induced by having the patient breath mist of sterile distilled water from a DeVilbiss Ultrasonic Nebulizer, Model 800/883. Each sputum is collected in a Petri dish, then streaked on four glass slides. The slides are put into Coplin jars containing equal parts of ether and 95 per cent ethyl alcohol. The staining of the slides is done by the standard Papanicolaou procedure.

Discussion

The theory that alveolar macrophages are derived from alveolar tissue may be an explanation for these processes. They may represent a remnant of cytoplasmic processes from alveolar wall tissue. Papanicolaou demonstrated that endometrial cells have the apparent ability to differentiate into free phagocytes when exfoliated during the late menstrual and early proliferative stage of the menstrual cycle.[2] A similar phenomenon may occur in the alveolar spaces. Pinkett et al.,[3] demonstrated by their investigations using chromosome markers that approximately ⅓ of the alveolar macrophages are of alveolar origin and about ⅔ originate from the hematopoetic system. An observation that would question the idea that these processes are remnants of cytoplasmic "bridges" of tissue origin is that these macrophages are mature and phagocitizing cells. Some contain anthracotic pigment.

Another possibility as to the explanation of these eosinophilic processes is that bipolar orifices exist which excrete substances under certain conditions. Conversely, why would this unidentified substance remain attached to the cell and stain in a consistent way?

The work of Aronson[1] who cultured rabbit peritoneal histiocytes and lung macrophages in chambers poses another possibility of the origin and function of these processes. In all of his experiments, Aronson noted the macrophages formed bridges both between themselves and also the peritoneal histiocytes. Photomicrographs were published demonstrating the passage of bacteria from one cell to another through the bridges and by autoradiography the indication of the passage of RNA from one cell to another. If these processes are remnants of cytoplasmic bridges, one would not expect them to survive intact being expectorated and smeared on a slide. Conversely, why would the cytoplasmic remnant of the bridge stain differently than that of the cytoplasm of the cell? Moreover, the cytoplasmic remnants should appear in irregular loci on the cell.

From observing hundreds of these cells, we postulate that these processes may be adaptive extracytoplasmic changes due to an unknown factor.

Because these processes are bipolar and separated by 180° suggests an organized development phenomenon of the cell. The consistent cellular position is strong evidence that the processes are not random artifacts. The consistent differential staining between the processes and the cytoplasm indicates a variation in the protein. This also suggests specific cell organization which forms these processes.

All cells are multipotential and when the proper stimulus causes the unmasking of the genetic information, the cell develops into the particular mature cell needed. When some cells are exposed to a toxic substance of long duration, the primitive forms have the ability to produce adaptive changes in the maturing cell as in squamous cell metaplasia. We believe these processes could represent structure of similar adaptive change. Why only a few cells of this unusual morphology occur needs to be explained. The specific nature and function of these processes need further collection of precise data.

Summary

1. The occurrence of a rare morphological type of pulmonary macrophage is reported. The nucleus and cytoplasm of these histiocytes are normal in appearance, but eosinophilic processes present sharp contrast to the cyanophilic cytoplasm. The differential staining and morphology of these cells raise questions as to their origin and possible function. We are continuing our investigation.

2. A discussion as to possible origin is presented. These cells have been observed in specimens from smokers and non-smokers.

3. The hypothesis that these processes may be adaptive extracytoplasmic changes due to unknown factors is proposed in this preliminary report. •

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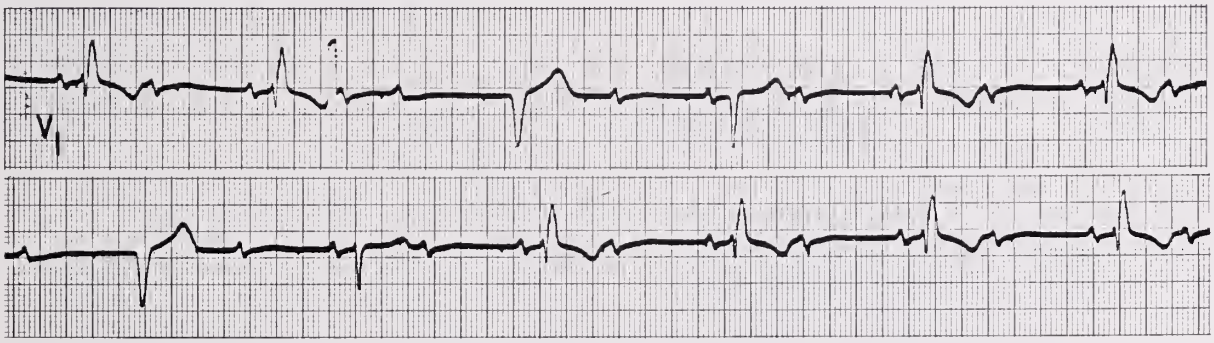
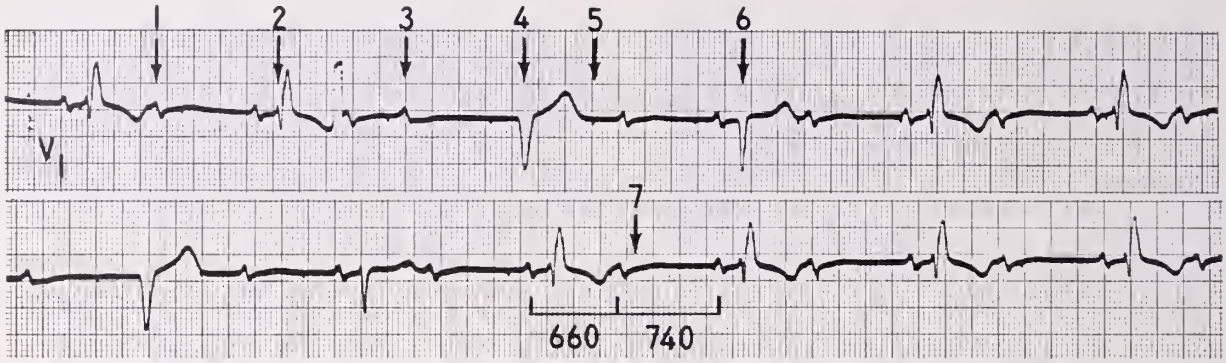
WHAT'S THE RHYTHM?

Prepared by Alan E. Lindsay, MD, Salt Lake City



THE PROBLEM: What Christmas present do you give to "the man who has everything"? What therapy do you administer to the patient who has multiple arrhythmias? The problem tracing for this month illustrates the difficulties posed when multiple arrhythmias are present in one ECG tracing. This ECG (continuous tracing of V_1) shows an abundance of abnormalities, but careful analysis allows us to ferret them out and to identify the real culprit. There are at least seven abnormalities of impulse formation or impulse conduction. See how many you can find before turning to next page to see a detailed analysis of the arrhythmias present.

A HINT: In approaching a complex arrhythmia of this type the best place to start is with P-waves. Measure the PP intervals and see if they are regular. If they are not, see what abnormal process might prevent their expected regularity. Second, pay attention to the QRS complexes and examine the morphology of those beats assumed to be conducted and those assumed not to be conducted. See if you can see any consistent relationship between P and QRS complexes. Watch carefully for any baseline abnormalities related neither to P-wave nor QRS complexes.



ANALYSIS of RHYTHM: There are at least seven abnormalities of impulse formation or conduction in this ECG.

1. The basic rhythm is sinus at a rate of 80 with 2:1 AV block. Arrow 1 points to the non-conducted P-wave.

2. The QRS complexes have the typical morphology of right bundle branch block.

3. This P-wave is premature and represents a non-conducted atrial extrasystole.

4. This QRS complex is late in timing and has abnormal QRS configuration. It is clearly a ventricular escape beat.

5. Tiny, regularly-spaced negative blips on the baseline (rate 75/min.) indicate a malfunctioning ventricular pacemaker.

6. This is a second ventricular escape beat but it happens to occur after an almost normal PR interval. Thus we have a fusion beat, the heart being activated both by the ventricular escape focus and the sinus mechanism simultaneously.

7. You will notice that the PP interval which contains a QRS complex is always somewhat shorter than the PP interval not containing a QRS complex. Arrow 7 indicates the differences in msec. between these two PP intervals. This is known as ventriculo-phasic sinus arrhythmia; the shorter PP interval reflects some type of chronotrophic effect of ventricular systole.

THERAPY: Quite clearly the 2:1 AV block is the major culprit here, with non-conducted atrial premature extrasystoles committing mild misdemeanors from time to time. Obviously the patient needs a faster ventricular rate and the quickest and most effective therapy would be to take appropriate action to see that the electronic pacemaker functions adequately.

ALFRED A. RICHMAN ESSAY CONTEST

Announcement of the 1971 Alfred A. Richman Essay Contest has been made by the American College of Chest Physicians. The annual contest offers undergraduate medical students throughout the world the opportunity to submit in open competition manuscripts on any phase of the diagnosis and treatment of cardiovascular or pulmonary disease.

Research or review articles relating to the diagnosis or treatment of cardiovascular or pulmonary disease are acceptable. In accord with the rules of the contest, preceptors are at liberty to assist the student in selecting a suitable subject and guide in the preparation of his essay.

Three cash prizes totaling $1,000 are awarded annually. The First Prize will be $500; Second Prize, $300 and Third Prize, $200. Each winner will also receive a certificate of merit. A trophy inscribed with the name of the winner and the name of his school will be presented to the winner's school.

The winning essayist will be announced by the judges in June, and subsequently, awards will be presented at the Annual Meeting of the College in October.

The official application form may be secured by writing Essay Contest, American College of Chest Physicians, 112 East Chestnut Street, Chicago, Illinois 60611, USA.

MEDICAL CONFERENCE
from the
UNIVERSITY OF NEW MEXICO SCHOOL OF MEDICINE

An approach to anemia*

William R. Hardy, MD; John H. Saiki, MD; and Ernest R. Simon, MD, Albuquerque, New Mexico

The physician must always consider anemia a sign and never a diagnosis, since the precise identification of its cause is always more important than its mere detection.

COMMON CLASSIFICATIONS of anemia are of limited value in approaching individuals who are anemic. Classifications based on etiology are cumbersome because the large number of causes of anemia are difficult to deal with systematically and because a specific etiology cannot always be identified. Morphologic classifications, based upon red cell size (macrocytic, microcytic, normocytic) and/or hemoglobin concentration (normochromic, hypochromic), are limited because only a relatively few anemias show these distinctive morphologic changes, leaving the physician with a bulky group of "normocytic, normochromic" anemias which are difficult to sort out further. Yet distinctive morphologic changes, when present, are important since they reflect functional changes affecting the developing and/or circulating red cells. The approach to anemia which we wish to emphasize is based upon a functional (physiologic) view of the events surrounding red cell production, circulation and destruction.[1-3] This approach (1) provides convenient categories for the subsequent definitive work-up; (2) furnishes information indispensable for proper management; and (3) utilizes procedures which are readily available to physicians everywhere — the blood film, reticulocyte count, serum bilirubin, and, in some cases, a bone marrow examination. A brief review of normal erythrokinetics and of normal body response to anemia is basic to understanding this approach.

I. Normal Erythrokinetics

Fig. 1 presents a schematic representation of the red cell's life. Erythrocytes exist primarily for transporting oxygen. It makes

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Dr. Hardy is Associate Professor of Medicine and Pathology; Dr. Saiki is Assistant Professor of Medicine; and Dr. Simon is Professor of Medicine.

sense, therefore, that their production is regulated by tissue oxygen tension. This is not direct, but through a tropic hormone (erythropoietin) which is formed by the interaction of a factor, produced chiefly by the kidneys, with a plasma substrate.[4] Erythropoietin induces marrow stem cells to differentiate into red cell precursors (erythroblasts). Following this initial differentiation, the erythroblasts replicate (usually undergoing four mitotic divisions to produce 16 daughter cells), and mature through successive qualitative changes which involve nuclear involution and cytoplasmic hemoglobin (Hb) accumulation. While replication (proliferation) and maturation are normally synchronized, they are distinct processes which may show dissociation in disease, as will be shown.

When newly formed cells are released from the marrow, they still retain traces of ribonucleic acid (RNA) which produces a faint grey appearance with Wright's stain, termed polychromasia. This RNA may be precipitated by supravital dyes, and cells so stained are recognized as reticulocytes. The continued catabolism of RNA results in disappearance of the reticulum after approximately one day, producing a mature red cell which circulates approximately 120 days. The fact that only newly released cells contain residual RNA provides a simple and convenient tag for recognizing such cells and a simple means for assessing red cell production.

At the end of its lifespan, the erythrocyte is phagocytized by a reticulo-endothelial (RE) cell. As hemoglobin is catabolized, iron and the amino acids of globin are reutilized within the body, while the porphyrin moiety is converted to bilirubin and discarded. The bilirubin (water insoluble) is bound to albumin ("indirect-reacting," unconjugated fraction), taken up by the liver, conjugated to the water soluble diglucuronide ("direct-reacting" portion), and excreted in the bile.

To sum up, the red cells and the erythroid marrow which produces them form an organ called the erythron, composed of a fixed portion, the marrow, and a circulating portion, the red cell mass. The cells of this organ may conveniently be divided into three categories: erythroblasts (nucleated red cell precursors), reticulocytes (some of which are in the marrow while others circulate), and circulating mature red cells. Note the interval which these cells spend in each compartment of the erythron (Fig. 1).

The kinetics of the erythron can be readily evaluated by examining the peripheral blood (hemoglobin and hematocrit, red cell morphology, reticulocyte count, unconjugated bilirubin), and marrow (histology and cytology). Marrow examination permits assessment of erythroblast proliferation and maturation, and gives information concerning erythroblast and RE iron stores. Proliferation is related to the number of erythroblasts, and is reflected by marrow cellularity and the erythroblast-granulocytic ratio (E/G). Maturation is evaluated by examining the qualitative changes of nuclear involution, and cytoplasmic hemoglobin accumulation. Since proliferation and maturation normally occur simultaneously, the relative number of erythroblasts increases with their maturity. This distribution may be visualized as a pyramid, with relatively few immature erythroblasts at the top and increasing numbers of the more mature erythroblasts at the bottom. Thus, an intact erythroblast pyramid typifies normal maturation. The presence of hemosiderin within developing erythroblasts (Prussian blue stain) indicates an adequate iron supply to the erythroid marrow, while its distribution within the erythroblast cytoplasm may point to disturbances in heme synthesis. Hemosiderin within marrow RE cells correlates with the quantity of body iron stores.

II. Normal Erythrokinetic Response to Anemia[5-7]

Sudden anemia, as by hemorrhage or hemolysis (Fig. 2), produces tissue hypoxia which, in turn, leads to the elaboration of erythropoietin. The marrow responds by (1) increased differentiation of stem cells into erythroid precursors, and (2) premature release of reticulocytes (as well as erythroblasts, if the stimulus is severe). The prematurely released reticulocytes are larger and contain more reticulum which takes longer to disappear than normal. Such "shift" reticulocytes are recognized as polychromatic macrocytes on the blood film. Under acute

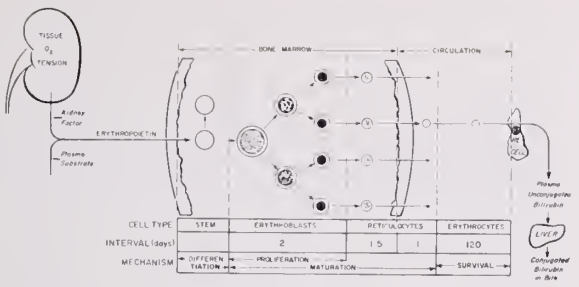


Fig. 1. Normal Erythrokinetics

circumstances, and provided iron supply is adequate, the normal marrow increases its red cell production about threefold within a week in response to moderate anemia (hematocrit 32-36 per cent) or fivefold, if the anemia is severe (hematocrit $<$ 25 per cent). If the anemia is sustained, as with chronic hemolysis, the normal marrow may increase its productive efforts eight to tenfold. "Shift" reticulocytes are again seen, but circulating erythroblasts are uncommon unless the anemia (and, therefore, hypoxia) is extreme. Marrow examination reveals increased proliferation (increased erythroblast cellularity, more marked with greater chronicity and severity) and normal maturation (intact pyramid).

III. Mechanisms and Classifications

In the light of this normal marrow response to anemia, persisting anemia might be expected on the basis of three possible pathophysiologic mechanisms (Fig. 1). First, the expected proliferation of red cell precursors may fail to take place (PROLIFERATION DEFECT). Second, increased proliferation occurs as expected, but maturation is so defective that a major portion of the developing cells are aborted before leaving the marrow, or, at most, circulate very briefly (MATURATION DEFECT). Finally, removal of circulating mature red cells may be so rapid as to outstrip the compensatory capacity of the normal marrow (SURVIVAL DEFECT). In anemic patients, several of these mechanisms may be present, but one is usually dominant. Identification of the dominant mechanism is the initial step in the approach to the patient with anemia. What causes these defects?

A. In PROLIFERATIVE DEFECTS, proliferation, maturation and release of red cells into circulation proceed at rates which are near basal (that is, rates encountered in normals who have no anemia), or even lower. Since increased proliferation is the expected response to anemia, even a normal (basal) level of red cell production in the face of anemia is distinctly abnormal. Diminished proliferation is encountered in two general situations. In the first, erythropoietin output is not commensurate with the depression in hemoglobin concentration. Such a "tropic" basis appears responsible for most of the anemias associated with chronic renal disease, many malignancies, certain of the endocrinopathies, and contributes (along with a diminished iron supply to developing erythroblasts) to the anemias of chronic inflammation. In the second, the erythropoietic stimulating mechanisms may be entirely normal, but end organ (marrow) failure may lead to impaired proliferation, as occurs, for example, with infiltration of the marrow by neoplastic, fibrous, or granulomatous tissue, or with marrow damage produced by radiation or by such chemicals as benzene, chloramphenicol and the cancer chemotherapeutic agents. Proliferative defects having a "tropic" basis are usually limited to the red cell line. By contrast, marrow damage or infiltration usually affects all hematopoietic cell lines, producing pancytopenia, that is, anemia, granulocytopenia, and thrombocytopenia. In marrow infiltration a leukoerythroblastic reaction (circulating erythroblasts and immature granulocytes) may also occur, apparently the result of damage to the sinusoidal barrier which normally prevents these cells from entering the blood stream. While most proliferation defects are also associated with a moderate shortening of red cell life span, the degree of shortening is not marked and would easily be overcome by a normal stimulus or normal marrow.

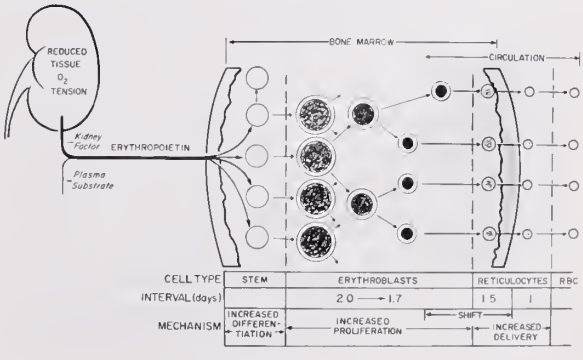


Fig. 2. Normal Erythrokinetic Response to Anemia

B. MATURATION DEFECTS disrupt the orderly process of nuclear involution and/or cytoplasmic production of hemoglobin. This permits subdivision into those which predominantly affect the cytoplasm (in essence hemoglobin synthesis), or the nucleus. In maturation defects, extensive destruction of immature cells occurs within the marrow. The cells which are sufficiently viable to enter and remain in circulation often show a variety of shapes (nonspecific poikilocytosis); nevertheless, they represent the best efforts of the defective marrow. The more severe the anemia, the more striking is the poikilocytosis.

Cytoplasmic maturation defects are limited to the erythroid cell line. The proliferative response of the marrow varies from slight (iron-deficient erythropoiesis) to maximal (the thalassemias and sideroblastic anemias). Most red cells are pale (hypochromic), small (microcytic), as well as poikilocytic. Such disturbances are produced by: (1) a limited iron supply to the erythroblasts, (2) reduced globin production (the thalassemic syndromes), and (3) impaired heme synthesis (the sideroblastic anemias). As indicated in Fig. 3, iron deficient erythropoiesis has features of both defective proliferation and defective maturation. In contrast to the other cytoplasmic maturation defects, iron lack to the erythroid marrow limits erythroblast proliferation. Accordingly, when the anemia is mild, red cell morphology is little affected and other features of a proliferative defect are dominant. Only with progressive severity do the characteristic features of a cytoplasmic maturation defect appear (poikilocytosis, microcytosis and hypochromia).

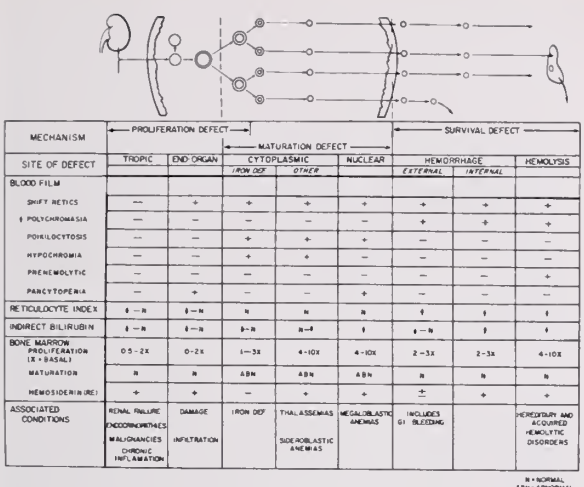
Nuclear maturation defects affect all hematopoietic cells, and probably all other rapidly proliferating body cells as well (in contrast to the cytoplasmic defects which are limited to the red cell line). As a result, the peripheral blood may be pancytopenic. Nuclear maturation defects produce a distinctive morphologic change termed megaloblastosis. The cytologic clues of megaloblastosis in the erythrocytic series are: (1) erythroblasts which are large (megalo = large, blast = germ), containing large nuclei with abnormally loose chromatin, (2) unimpaired hemoglobin synthesis, often with loss of cytoplasmic RNA before the nucleus is extruded, and (3) mature cells that are large (macrocytic) and contain increased amounts of hemoglobin, but at a normal concentration. Poikilocytosis is prominent, as is typical of defective maturation. The disordered nuclear development also affects the granulocytic series, producing characteristic "giant" metamyelocytes in the marrow, and hypersegmented granulocytes with neutropenia in the peripheral blood. The disturbed megakaryocytic development is reflected by marked variation in platelet size and in thrombocytopenia. B_{12} and folate deficiency are by far the most prevalent causes of megaloblastosis.

C. SURVIVAL DEFECTS. Here, the pathophysiologic lesion is premature loss of circulating erythrocytes, either by hemorrhage or hemolysis. The kinetics of marrow response to such loss have been previously described. Since proliferation increases and maturation is normal, the rate of delivery of reticulocytes and hence their number, rises in the circulating blood. The blood film reflects this accentuated productivity (increased polychromasia) and, in hemolytic disorders, may also show specific forms of poikilocytosis, either prehemolytic forms (microspherocytes, fragmented red cells), and/or changes relating to the etiology of the hemolysis (sickle cells, elliptocytes).

IV. Approach to the Patient With Anemia (Fig. 3)

If this functional classification of anemia is to be practical, the physician must be able to implement it with procedures that are readily available and easily interpretable. The blood film, reticulocyte count, serum bilirubin, and bone marrow examination all meet these qualifications. What are the values and limitations of these procedures?

A. BLOOD FILM. Examination of the blood film is most useful in providing morphologic clues of previously discussed functional events. As indicated in Fig. 3, a systematic examination of red cell morphology should include a search for polychromatic macrocytes ("shift" reticulocytes), nucleated red cells ("shift", end-organ infiltration), increased numbers of polychomatic cells (reticulocytosis), nonspecific poikilocytosis (maturation defects), hypochromia (impaired



MECHANISM	PROLIFERATION DEFECT		MATURATION DEFECT			SURVIVAL DEFECT		
SITE OF DEFECT	TROPIC	END ORGAN	CYTOPLASMIC		NUCLEAR	HEMORRHAGE		HEMOLYSIS
			IRON DEF	OTHER		EXTERNAL	INTERNAL	
BLOOD FILM								
SHIFT RETICS	—	+	+	+	+	+	+	+
↓ POLYCHROMASIA	—	—	—	—	—	+	+	+
POIKILOCYTOSIS	—	—	+	+	+	—	—	—
HYPOCHROMIA	—	—	+	+	—	—	—	—
PRENEMOLYTIC	—	—	—	—	—	—	—	+
PANCYTOPENIA	—	+	—	—	+	—	—	—
RETICULOCYTE INDEX	↓ — N	↓ — N	N	N	N	↑	↑	↑
INDIRECT BILIRUBIN	↓ — N	↓ — N	↓ — N	N → ↑	↑	↓ — N	↑	↑
BONE MARROW PROLIFERATION I.R. = BASAL)	0.5 - 2x	0 - 2x	1 — 3x	4 - 10x	4 - 10x	2 — 3x	2 - 3x	4 - 10x
MATURATION	N	N	ABN	ABN	ABN	N	N	N
HEMOSIDERIN (RE)	+	+	—	+	+	±	+	+
ASSOCIATED CONDITIONS	RENAL FAILURE ENDOCRINOPATHIES MALIGNANCIES CHRONIC INFLAMATION	DAMAGE INFILTRATION	IRON DEF	THALASSEMIAS SIDEROBLASTIC ANEMIAS	MEGALOBLASTIC ANEMIAS	INCLUDES GI BLEEDING		HEREDITARY AND ACQUIRED HEMOLYTIC DISORDERS

N = NORMAL
ABN = ABNORMAL

Fig. 3. Approach to Anemia

Hb synthesis), and the specific morphologic changes (microspherocytes, fragmented cells, sickled cells, etc.) that may be seen in hemolytic disorders. The number and morphology of the granulocytes and platelets may supply additional clues concerning the mechanism.

Proliferative defects having a "tropic" basis usually show little more than an accentuation of the normal variation in red cell diameter. In select circumstances, semispecific poikilocytosis may occur (burr cells in uremia, target cells in hepatobiliary disease). With marrow damage or infiltration, "shift" reticulocytes are usually prominent, though few in number, and pancytopenia is often present. Leukoerythroblastosis suggests disruption of the marrow stroma by malignant cells or fibrous tissue. Except for minimal to mild hypochromia, and perhaps an occasional "shift" reticulocyte, mild iron deficiency has the morphology of "tropic" proliferative defects. As previously noted, with progressive severity, the characteristic features of *cytoplasmic maturation defects* dominate, (nonspecific poikilocytosis, hypochromia, and microcytes). These features also characterize the thalassemias. The presence of two more-or-less distinct red cell populations (one, normochomic and normocytic, the other, hypochomic, microcytic and poikilocytic) is termed anisochromia and is characteristic of the sideroblastic anemias. Anisochromia may also result from transfution of a patient with a hypochromic anemia, or follow iron therapy for iron deficiency anemia. *Nuclear maturation defects* share the poikilocytosis of the other maturation defects but are normochomic since Hb synthesis is not impaired. Additional characteristics include macro-ovalocytes, granulocytopenia with hypersegmented neutrophils, and thrombocytopenia with giant platelets.

Survival defects usually, but not always, evoke a proliferative marrow response, giving rise to increased numbers of polychromatic cells, more marked with hemolysis than with hemorrhage. Nonspecific indicators of hemolysis include microspherocytes and fragmented cells; elliptocytes or sickled cells point to specific hemolytic disorders.

B. RETICULOCYTE INDEX. The reticulocyte index reflects the rate that new red cells are delivered to the peripheral blood. With the information that newly released cells normally require about one day to lose their reticulum and that erythrocytes survive about 120 days, one can predict that the normal reticulocyte count would be about one per cent (or on an absolute basis, about 50,000/mm^3).With anemia, the reticulocyte per cent needs to be converted to an absolute value to estimate marrow productivity. This is done utilizing the following formula:

$$\frac{\text{Patient's Hematocrit}}{45} \times \text{Patient's Reticulocyte \%} = \text{Absolute Reticulocyte count (\%)}.$$

In addition to correcting the reticulocyte percentage for anemia, one must also correct for the "shift" produced by hypoxia and erythropoietin, since the shifted reticulocytes retain their reticulum longer than the normal 24 hours (Fig. 2). Such a "shift" may be assumed whenever a population of larger, unusually blue cells are detected (polychromatic macrocytes). The extent of this correction is roughly predictable from the severity of the anemia. In a stimulated marrow, hematocrits of 35, 25, and 15 per cent are associated with prolongations in blood reticulocyte maturation of about 1.5, 2.0, and 2.5 times normal, respectively.[5,6] Since the normal reticulocyte percentage is about 1, the final "corrected" reticulocyte count may be expressed as an index:

Reticulocyte Production Index = $\frac{\text{Absolute Reticulocyte Count (\%)}}{\text{Reticulocyte Maturation (x normal)}}$, indicating red cell production as a multiple or fraction of 1.

As an example, a patient with a hematocrit of 23 per cent, a reticulocyte count of 20 per cent, and polychromatic macrocytes on the blood film, would have an absolute reticulocyte count of 10 per cent (correction for anemia) and an index of five (correction for shift), indicating a red cell production approximately five times basal. In relation to the functional classification of anemia, one would predict and, indeed, finds sustained high reticulocyte indices only in survival defects. More specifically, a sustained reticulocyte index greater than three to four times basal indicates hemolysis, since only hemoglobin catabolized within the RE system can supply sufficient iron to permit erythroblast proliferation of this degree.* Unsustained reticulocyte indices of this magnitude may be seen transiently in patients responding to specific replacement therapy (B_{12}, folic acid). With internal hemorrhage, delivery of cells into circulation rarely exceeds two to three times the basal rate.

C. "INDIRECT" BILIRUBIN. If, and only if, an anemia is stable (reflected by little change in the hemoglobin and hematocrit over several days or longer, indicators of red cell production (marrow examination, reticulocyte index) become indirect measures of destruction (serum "indirect" bilirubin), and vice-versa. Since the major source of the serum "indirect" bilirubin is the catabolism of hemoglobin, its measurement yields additional information concerning erythrokinetics. Interpretation of the "indirect" bilirubin as an indicator of red cell destruction is valid only if significant hepatobiliary disease is excluded by a normal "direct-reacting" serum bilirubin concentration. Note that the "indirect" serum bilirubin reflects total pigment breakdown, whether in the marrow and/or in the periphery, and so cannot be used to distinguish certain maturation defects (megaloblastic disorders, thalassemias) from those survival defects with increased internal hemoglobin catabolism (hemolysis, internal hemorrhage). Proliferation defects, along with external blood loss—including the G. I. tract — of course lower the bilirubin level since internal hemoglobin catabolism is reduced. Some maturation defects (iron deficiency, sideroblastic anemias) do not elevate the "indirect" bilirubin, because insufficient heme is synthesized for subsequent breakdown. Finally, interpretation of the bilirubin level, like the reticulocyte count, must relate to the severity of the anemia. For example, a bilirubin value within the normal range (e.g. 0.8 mg/100 ml total/0.1 mg/100 ml direct) would be elevated in a patient with only 5g/100 ml hemoglobin.

D. BONE MARROW EXAMINATION. The dominant mechanism leading to the anemia can usually be established by a careful interpretation of the blood film, reticulocyte index, and serum bilirubin. If additional data is required to establish the functional category, examination of the bone marrow aspirate may provide it. As previously noted, the marrow allows estimation of both proliferation (cellularity and E/G) and maturation (integrity of the pryamid). In the proliferation defects the number of erythroblasts may be reduced or normal. If the proliferation defect is due to marrow failure, the presence of damage, or the nature of the infiltrate can often be identified. In maturation defects, proliferation is usually significantly increased (only slightly in iron deficiency anemia), but because of intramedullary erythroabortion, the pyramid is altered (relative increase in the more primitive erythroblasts). Megaloblastosis characterizes the nuclear defects; scant, shaggy cytoplasm, poorly filled with hemoglobin, the cytoplasmic defects. Staining for hemosiderin in RE cells permits evaluation of iron stores and is especially valuable in differentiating iron deficient erythropoiesis due to body iron lack from inflammation (Table I). Staining for erythroblast hemosiderin (sideroblasts) shows distinctive features: iron deficiency—no stainable iron; sideroblastic anemia — erythroblasts with increased amounts of hemosiderin deposited in a perinuclear halo ("ringed sideroblasts"); and thalassemias — erythro-

*An exception is phlebotomy-induced proliferation in idiopathic hemochromatosis, with parenchymal and RE cell iron overload.

blasts with increased amounts of hemosiderin deposited in a random fashion throughout the cytoplasm. Additional features which distinguish these four types of cytoplasmic defects are shown in Table I. Lastly, in survival defects, the marrow reveals erythroid hyperplasia with a normal maturation pyramid, the degree of hyperplasia being more marked in chronic than in acute disorders. The changes that occur in each of these measurements are summarized in the lower half of Fig. 3.

We must emphasize that in classification, the measurements of red cell production and destruction are most useful under "steady state" conditions (i.e. when hematocrit and hemoglobin values are relatively stable), and must be used cautiously at other times. **Decreased Marrow Stimulation** accounts for most of the anemias associated with certain of the endocrinopathies, chronic renal failure and contributes to the anemias of chronic inflammation. **End Organ Failure** occurs with marrow damage, replacement, and mild iron deficient erythropoiesis. **Defective Maturation** is prominent in moderate to severe iron lack, thalassemia, the sideroblastic anemias, and in the megaloblastic anemias due to folate and B_{12} deficiency, while hemorrhage and the entire group of hemolytic disorders comprise the group of **Survival Defects.**

The purpose of this physiological approach to anemia is to permit the physician to identify the erythrokinetic lesion, which then enables him to proceed towards further specific diagnosis (if required) based on information obtained from the medical history, physical examination, perhaps a *few* additional laboratory tests, and, when possible, therapeutic response. While specific etiology is a desired goal, the physiologic concepts which we have stressed may not be bypassed, since often multiple causes operate to produce anemia. This is important from at least two aspects: (1) Any patient with a primary disturbance in red cell production or destruction is rendered more susceptible to the other mechanisms of anemia. As an example, a patient with sickle cell disease has a basic survival defect which typically evokes a proliferative marrow response. Sudden worsening of the anemia in such a patient might be due to several mechanisms: a proliferation defect may be added owing to superimposed infection, a maturation defect due to concomitant folate deficiency, or the survival defect may be accentuated by increased red cell destruction (or sequestration) by an enlarging spleen. An appreciation of such contributory factors is as important for proper management as is recognition of the primary defect. (2) Conversely, just because a patient has an illness, such as renal failure, which

TABLE I

	Iron Deficient Erythropoiesis		Sideroblastic Anemias	Thalassemias
	Iron Lack	Inflammation		
Serum iron	Low	Low	High (or normal)	High (or normal)
Total Iron-Binding Capacity (TIBC)	High	Low	Low (or normal)	Low (or normal)
Percent Saturation of TIBC	Low	Low	High (or normal)	High (or normal)
Marrow Sideroblasts	Absent (Low)	Absent (Low)	Increased; "Ringed" Sideroblasts	Increased; "Iron-loaded" Sideroblasts
Marrow RE Hemosiderin	Absent	Present	Increased	Increased
Erythroid Proliferation (X Basal)	1 - 3	1 - 3	4 - 10	4 - 10
"Indirect" Bilirubin	Decreased	Decreased	Decreased or normal	Increased
Response to Iron Therapy	Yes	No	No	No

usually produces a proliferation defect, does not protect him from survival or maturation defects. Assessment of the kinetics of the anemia in each patient permits the identification of such contributory mechanisms.

V. Significance of Anemia in the Patient[1,5,8]

Anemia may be defined as a decrease (say, greater than 10 per cent) in the concentration of circulating hemoglobin expected on the basis of age, sex, altitude, or an associated condition which typically produces erythrocytosis. Anemia leads to tissue hypoxia. Still, the red cell is only one link in the body's oxygen transport system; factors other than the level of circulating hemoglobin which influence oxygen delivery include: the degree of arterial oxygen saturation, the position of the Hb-O_2 dissociation curve, and the regional blood flow. The overall balance between oxygen supply and tissue demand may be expressed as:

$$\frac{\text{Supply}}{\text{Demand}} = \frac{\text{Blood Oxygen Delivery Capacity x Blood Flow}}{\text{Tissue Need}}$$

When the hemoglobin concentration falls gradually, the plasma volume expands, reducing blood viscosity and maintaining blood volume nearly constant, the partial pressure of oxygen in the tissues declines, and the Hb-O_2 dissociation curve shifts to the right, permitting more oxygen to be extracted from capillary blood. If delivery of oxygen is inadequate to meet tissue needs, a compensatory increase in cardiac output and stroke volume takes place. Blood flow is diverted from kidneys, skin, and extremities, to apparently more vital areas. These physiologic adjustments are influenced by (1) severity, (2) chronicity, (3) competency of the cardiovascular system and other physiologic corrective mechanisms, and (4) the individual's oxygen requirements (i.e., levels of physical and metabolic activity). As a consequence, the gradual development of mild anemia (Hb concentration 10 to 13g/100 ml), or even moderately severe chronic anemia (Hb concentration 6 to 10g/100 ml), may not produce tissue hypoxia or significant symptoms at rest, unless the compensatory mechanisms are comprised or an increased oxygen demand exists. As oxygen needs are increased by physical activity or disease, moderate anemia may produce symptoms and signs which relate both to compensatory cardiovascular adjustments, and to the decreased regional blood flow with supervening tissue hypoxia. Hyperpnea, palpitation, tachycardia, systolic murmur, and increased pulse pressure reflect the former; weakness, fatigue, occasionally syncope, as well as pallor, the latter. In an otherwise healthy individual with chronic anemia, exertional dyspnea will appear at an Hb concentration around 7.5g/100 ml, weakness at less than 6, dyspnea at rest at about 3, and cardiac failure at around 2.5g/100 ml.[8] In older patients with vascular disease, local tissue ischemia may be manifested as angina pectoris, intermittent claudication, and mental slowing. These symptoms imply defective oxygen delivery regardless of cause; hence, the presence of anemia must be confirmed by the hematocrit and/or hemoglobin concentration.

Summary

More important than symptomatology, anemia is a sign of a pathologic process which often is of far greater significance to the well being of the patient than is the anemia itself. •

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"Chaparrel tea" in the treatment of cancer

C. R. Smart, MD, H. H. Hogle, MD, H. Vogel, MD, A. D. Broom, PhD., and D. Bartholomew, Salt Lake City, Utah

On January 12, 1969, at the Annual Scientific Meeting of the Utah Chapter of the American College of Surgeons held at Park City, Utah, a Surgical Resident at the University of Utah presented a prize winning paper on an interesting regression of melanoma in a patient taking "Chaparrel Tea." This unfortunately was covered by the news media and released internationally through the United Press. Thousands of inquiries have been and continue to be answered. "Chaparrel Tea" became the latest addition to the medicine man's armamentarium for the "cure" of cancer. A preliminary report was published in Cancer Chemotherapy Reports, April 1969. The present report summarizes our investigation of this remedy.

The Beginning

On October 20, 1967, an 87-year-old white male was seen at the University of Utah Medical Center. He gave a history of having a small slightly raised brown "mole" on his right cheek which five or six years earlier had become gradually larger and more darkly pigmented. The lesion was excised and he was told that it was malignant but had been completely removed. Within a year it returned and had to be removed two additional times. When it recurred for the fourth time he sought no further medical care. During the past six to nine months he had become weak and pale and had lost considerable weight and the lesion had increased from about 1 cm. to its present 3.5 cm. in diameter. He had noted the gradual enlargement of a mass in the right submandibular area which now measured 5 x 7 cm. in diameter. Fig. 1. A wedge biopsy of the facial lesion and a needle biopsy of the neck mass revealed malignant melanoma and necrotic debris respectively.

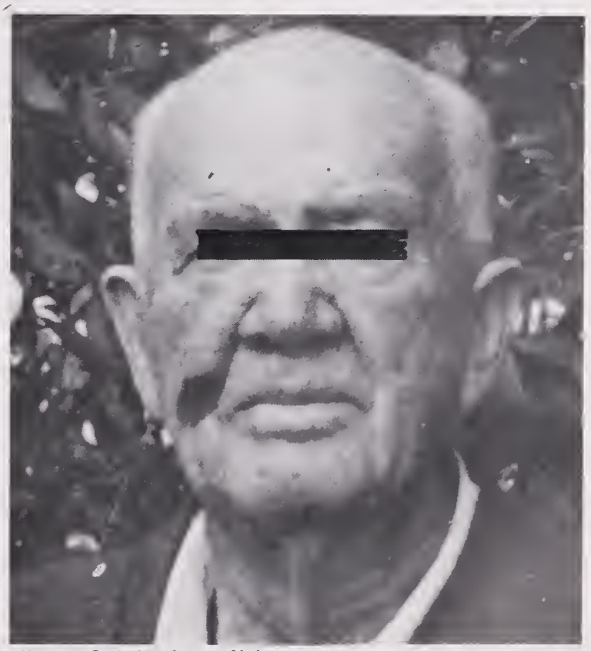

Fig. 1. Original condition.

*From the University of Utah College of Medicine, Department of Surgery and College of Pharmacy, Salt Lake City, Utah.

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Fig. 2. After treatment.

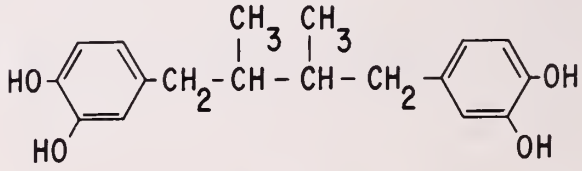
Surgical excision of the facial lesion in continuity with a radical neck dissection were advised, but the patient decided against any treatment. In November, 1967, he began taking "Chaparrel Tea" an old Indian remedy for colds, rheumatism, venereal disease, bowel cramps, antisepsis and diuresis. This tea was made by steeping the dried leaves and stems of a desert shrub, creosote bush (Larrea divericata), in hot water. He drank two cups of this tea daily, only rarely missing a dose, and he took no other medications. By February, 1968, (according to his children), the facial lesion had decreased to the size of a dime and the neck mass had disappeared, he looked better, and had begun to gain weight and strength. He returned to the University of Utah Medical Center in September, 1968, at which time the lesion on his cheek measured only 2-3 mm in diameter and there were no masses in the neck. Lesion was excised and showed malignant melanoma. He had gained 25 pounds and looked greatly improved in color and general health. Fig. 2.

Identification, Phytochemistry, and Pharmacology of the Plant

Several samples of the stems and leaves of the creosote bush from several areas of the Southwestern United States were gathered and identified by the University of Utah Botany Department as Larrea divericata Cav. Fam. *Zygophyllaceae*. This plant is indigenous to the southwestern deserts of the United States and has been used for many ailments by the Indians of the region. A review article on the occurrence and medicinal uses of the plant has been published.[1] The leaves and stems of Larrea contain considerable amounts of gums and resins,[2] but phytochemical studies in 1945[3] revealed only one chemical of any significance, nordihydroguaiaretic acid (NDGA, 2,3-dimethyl-1, 4-bis (3,4-dihydroxyphenyl) butane). The chemical structure of NDGA is shown in Fig. 3. Until 1967, when more effective antioxidants were introduced, NDGA was a common additive to human foods, at levels of 0.01-0.02 per cent and has been a part of the American diet.

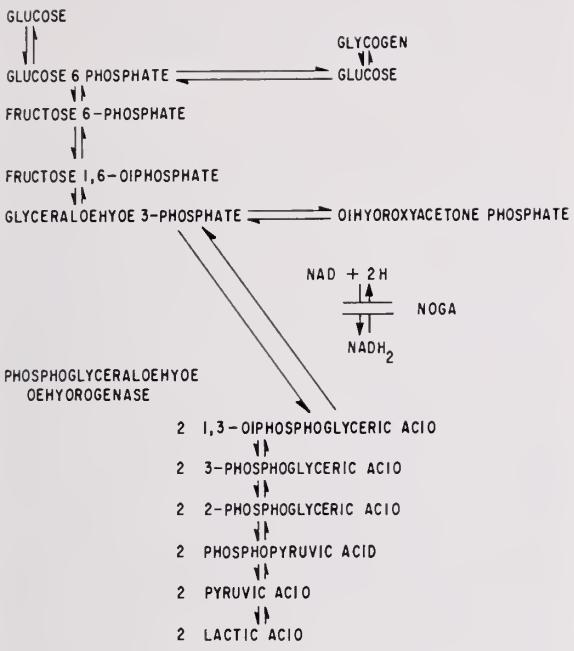
The use of NDGA in pharmacology and medicine has been reviewed.[4,5] Its effect as an analgesic and vasodepressant in cats, dogs, and humans has been reported.[5] Several studies have been made on the acute and chronic toxicity of NDGA in animals.[5-8] Cranston, et al,[8] studied the chronic toxicity of NDGA over a two year period in rats at the concentration of 0.5 per cent in the diet and found no overt toxic symptoms. Acute toxicity in the rat is measured by an LD-50 of 5.5 Grams per kilo (oral administration, ref. 5). A very recent report on the toxicology of NDGA offers a note of caution with regard to its use in the human diet.[9] It was indicated that NDGA fed to rats at levels of 0.5 to 1.0 per cent in the diet for 74 weeks caused cystic reticuloendotheliosis of paracaecal lymph nodes and vacuolation of kidney tubular epithelium. The implication is made that the toxic agent is most probably the ortho-quinone derived from the metabolism of NDGA. The statement was made that in rats fed 1 per cent or less of NDGA in the diet, little effect

Figure 3



NORDIHYDROGUAIARETIC ACID (NDGA)

Figure 4



(Probable) Site of action of NOGA in blocking anaerobic glycolysis (31)

was seen in tubular function. NDGA has been administered to humans in intramuscular doses of up to 400 mg/kg/day for periods as long as five to six months with little evidence of toxicity.[5]

Burk and Woods have reported[4] that NDGA is an extremely potent inhibitor of both anaerobic and aerobic glycolysis and is a very effective cancer antimetabolic agent against Ehrlich carcinoma and L 1210 mouse leukemia ascites cells in vivo and in vitro. They have suggested a possible mechanism of action for NDGA based on the work of Warburg[10] which indicates that tumor cells respire by the anaerobic pathway. The use of NDGA as a food additive is due to its ability to inhibit anaerobic glycolysis. It was believed that it acts by a similar mechanism in the tumor cell. Burk and Woods further suggest that NDGA indirectly inhibits the enzyme glyceraldehyde-3-phosphate dehydrogenase by blocking the conversion of NADH to NAD, resulting in a too low NAD/NADH level. Fig. 4.

Pardini and Fletcher[11] recently demonstrated the in vitro effectiveness of NDGA in inhibiting mitochondrial NADH oxidase and

Figure 5

SUMMARY OF 59 PATIENTS TREATED WITH NDGA OR CHAPARREL TEA

Tumor Type	Total Rxed	Evaluable	Regression	Subjective Improvement
Melanoma	12	10	2*	6
Sarcoma	8	5	0	3
Colon	6	5	2±†	3
Larynx & Mouth	6	6	0	6
Lung	5	4	0	2
Breast	5	4	0	1
Salivary Glands	2	2	0	1
Hepatomas	2	1	0	1
Ovary	3	0	0	0
Stomach	1	1	0	0
Pancreas	2	1	0	0
Thyroid	1	1	0	0
Kidney	1	1	0	1
Testicle	1	1	1‡	1
Lymphoma	1	1	1¶	0
Chordoma	1	1	0	1
Skin	1	1	0	0
Unknown	1	0	0	0
	59	45	4	27

Patients were considered to have had an objective regression if the tumor decreased by 25 per cent or more in size.

Duration of Response: *(3 and 20 months)
†(12 months)
‡(2 months)
¶(10 days)

succinoxidase activity. In dilute concentrations, NDGA appeared to have a stimulatory effect (as noted earlier by Burk[4]) while in higher concentrations there was striking respiratory inhibition. They are utilizing this method as a sensitive screening test for anticancer agents.

The screening of NDGA by the Cancer Chemotherapy National Service Center in 1955, 1959 and more recently in 1969, was negative against sarcoma 180, mammary adenocarcinoma 755, and leukemia L 1210 in mice.[12-14]

Studies in mice have been carried out at the University of Utah by Vogel, Hogle and Smart, utilizing the Ependymoblastoma and Melanoma S 91 tumors. There were four ependymoblastomas which disappeared and two others which had retarded growth in 104 tumor bearing mice treated orally with either "Tea" or NDGA. There were no cases of inhibition in the 150 mice with the Melanoma S 91 similarly treated.

In view of the striking regression of the melanoma in the first patient,[15] and supported by the laboratory data showing low toxicity and the inhibition of various tumors in the literature[4] by nordihydroguaiaretic acid (NDGA), a major constituent of "Chaparrel Tea," FDA investigational approval was obtained and clinical trials carried out.

Results

From November, 1968, through November, 1969, 59 patients with advanced incurable malignancy were treated (Figure 5). Most of these patients were treated with "Chaparrel Tea," an aqueous extract of Larrea divericata containing NDGA, drinking two or three 8 oz. glasses daily. Twenty-three of these patients were treated with the pure compound, ranging from 250 mgs to 3000 mgs/day by mouth. At the beginning of the study, baseline hemoglobin, white blood count, urinalysis, BUN, SGOT were done. These values were then repeated at two to four week intervals in the majority of patients. No hematologic or chemical abnormalities attributable to the treatment have been observed. Patients were considered evaluable if they received at least four weeks of treatment or had a 25 per cent or greater decrease in the size of their tumor. The following toxicities

Fig. 6. Before treatment.

Fig. 7. After treatment.

were observed: nausea and vomiting 13, diarrhea 9, abdominal cramps 2, rash 1, stomatitis 1, fever 1. Fifty-nine patients were treated, of which 45 had an adequate trial and were evaluable. Four patients had significant tumor regressions: the original patient with melanoma and one other melanoma patient, one with a choriocarcinoma of the testicle with pulmonary metastases (Figure 6 and 7), and one with a lymphosarcoma. One patient, considered unevaluable because of continued treatment with 5-Fluorouracil, had a striking regression of liver metastases and decrease in serum bilirubin upon the addition of NDGA to her chemotherapeutic regimen. She had been deteriorating rapidly on 5-Fluorouracil alone. A second patient with a metastatic adenocarcinoma of the colon had a striking resolution of tumor on one observation but died the same day of a pulmonary embolus and is therefore not considered among the four regressions. The majority of patients, 27, had subjective improvement while many of their tumors were objectively growing rapidly.

Conclusions

According to the definition of the National Cancer Advisory Council, NDGA or Chaparrel Tea is not an effective anticancer agent, namely an agent that will cause a significant regression of 20 per cent of a specific cancer type lasting for a minimum of two months. While tumor regressions have occurred in a few cases, a significant number of cases appear to have had tumor stimulation, particularly noted in those tumors which are easily observed—head and neck, breast, melanoma and those with pulmonary metastases from other sites. This finding is not unexpected since in vitro studies have shown stimulation of tumor cell growth[4] and stimulation of respiratory enzyme activity[11] at low concentrations, although inhibition is conspicuous at higher NDGA concentrations.[4-11] Until this phenomenon can be clarified, it would seem inadvisable for cancer patients to continue indiscriminately treating themselves with "Chaparrel Tea," which unfortunately has become a widespread common practice in this area. •

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Modified Sturmdorf amputation of the uterine cervix

W. H. Pennoyer, MD, Cheyenne, Wyo.

A report of experience with the modified Sturmdorf procedure and a review of indications for its use.

Disease of the uterine cervix has always been a problem for the physician. Tracheloplasty has been a time-honored and useful tool for both diagnosis and treatment of this condition. In 1916 Sturmdorf first reported his technic and experience with tracheloplasty. We employ a modification of the Sturmdorf technic as described by Bielecki in 1964.

Indications for tracheloplasty come under two main categories of disease. One is a positive or suspicious Pap's smear. Since the introduction of cytologic diagnosis by Papanicolaou in the early 1940's the popularity of this examination has grown steadily. Today the physical examination should always include the Pap's smear. One-half per cent of these are positive or suspicious but with no evidence of gross malignancy. These patients are best treated and diagnosis established surgically with tracheloplasty. In the second category are selected cases of erosion and endocervicitis. Although many cases of cervical erosion and endocervicitis can be successfully treated as office procedures a certain per cent resist conservative management. In this latter group the modified Sturmdorf amputation gives a satisfactory result.

The two methods of treatment of the diseased cervix are cautery and the cold knife cone. Cautery has various modalities. The electro-cautery knife is used to make radial incisions through the diseased cervical tissue, the electro-cautery wire is used to cone out the cervical canal, both approaches relying on heat for destruction of diseased tissue. There is a new form of cautery that uses freezing to destroy tissue, Cryosurgery, currently under investigation in several areas of the country.

The cold knife cone is the method of choice if biopsy material is to be obtained. There are variations in control of bleeding. First, a less extensive cone is done involving only the outer portion of the cervix and extending into the cervical canal only about six millimeters, using gauze packing for hemostasis. Second, the usual cone is done and following this silver plated clips are placed on the cut edges of the cervix. For further hemostasis a chromic suture is placed on each side of the cervix as is done with the original Sturmdorf. The Sturmdorf procedure itself is familiar to most surgeons. Its modification as proposed is as follows:

1. Prepare perineum and vagina as usual.
2. Dilate the cervix.
3. Inject normal saline with neosynephrine into the cervix to control bleeding.
4. Stain cervix with Lugol's or Schiller's solution to help outline the area to be removed.
5. Make a circular incision in the cervix to include all the diseased portion. The incision is extended up to the internal os and includes all the glandular elements of the cervical canal. After completing the cone a thorough and careful curettement of the uterine cavity and remaining cervix is done. The Sturmdorf stitch, with its modification, is then carried out. Fig. 1 on a curved trochar needle, No. 1 chronic suture

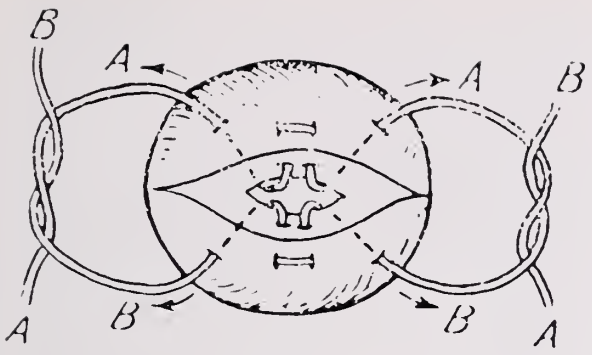

Fig. 1.

is passed through the anterior lip, from outside in, then from inside out, leaving the ends long. With the needle still on the suture it is passed up into the cervix and through the superior lateral wall near the internal os, coming out more laterally than usual. The needle is then placed on the other end of the suture and brought through the cervix on the opposite side. Both ends are left long. A like procedure is carried out for the posterior lip with the suture ends coming out on the posterior lateral walls of the cervix. The four ends are then drawn up inverting the cervical lips. The two ends on one side are tied, then the two ends on the opposite side are tied, making sure the suture is pulled firmly enough to control bleeding from the cervical branches of the uterine vessels. The additional lateral sutures are not needed. One or two interrupted sutures may be required to close the corners of the cervix. A small Hegar dilator is then passed through the cervix to insure its patency.

Summary

Various methods of treating the uterine cervix have been reviewed. With a positive or suspicious Pap's smear certainly a cold knife cone is indicated. Also, in many cases of erosion and endocervicitis a cold knife cone will give a more satisfactory result than cautery. There will be less morbidity, and the patient will avoid much of the troublesome discharge associated with cautery. The Modified Sturmdorf leaves a clean, quickly healing incision that closely simulates the original anatomy of the cervix. It also gives the pathologist an adequate. undamaged, specimen for study. Bielecki's modification of closing the coned out cervix is a better procedure than the original Sturmdorf in that the suture used to invert the cervical lips also provides hemostasis for the cervical vessels and so makes further hemostatic suturing of the cervix superfluous. •

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Annual income of the United Nations Children's Fund is less than the amount spent on world armaments in two hours.

MATERNAL MORTALITY

The following case has been reviewed by the Colorado Maternal Mortality Committee* and selected for publication because of its educational value.

Toxemia

Although toxemias occur in only six per cent of pregnancies they represent a very grave complication and account for one third of the maternal deaths in the United States.[1] The toll of fetal wastage is even more astounding. It has been estimated that at least 30,000 stillborns and neonatal deaths are attributable to toxemia of pregnancy.[2] The case we present this month graphically indicates that we must be ever alert to any patient who presents a history indicative of hypertension, as even the efforts which might be employed to reverse the course of toxemia can prove futile.

CASE REPORT

An 18-year-old female was admitted to the hospital following a grand mal convulsion. The patient's last menstrual period was seven and a half months previously; four months prior to admission she was seen in the ante-natal clinic where a normal pregnancy at 14-16 weeks of gestation was noted. The patient was seen at monthly intervals and on each visit was found to be normotensive and with no edema or proteinuria. Two weeks prior to admission she was seen in the clinic complaining of headache and nausea, and blood pressure was found to be 138 systolic 98 diastolic. She had gained seven pounds of weight in the previous month but there was no proteinuria or edema. No therapy was given. On the day of admission she complained of back pain and mid-epigastric pain, and she had a non-focal, generalized clonic-tonic seizure while in the emergency room. She had had no dysuria, hematuria, frequency, shortness of breath or chest pain. She had no previous history of convulsions and denied visual disturbances.

There was past history of hayfever in childhood. Two years prior to admission she had an acute asthmatic attack precipitated by aspirin; despite bronchodilator therapy and hyposensitization, she continued to wheeze intermittently and was commenced on prednisone (10 mg QOD) eighteen months prior to admission and intermittently required higher doses. One year prior to admission she had an episode of pneumonia with worsening of the asthma, but recovered quickly. Three months prior to admission, she had an acute asthmatic attack which required a short period of hospitalization and increased doses of steroid therapy. She had a mild chronic cough which was productive of small amounts of yellow sputum. Past history was otherwise unrevealing; she had had no previous pregnancies and no surgical procedures. The patient's father had a history of hayfever but there was no other family history of allergy, and there was no family history of convulsive disorders or renal disease.

Physical examination on admission revealed an obtunded Negro female in no distress. The pulse was 80/min; temperature 37°C; blood pressure 172/132 in both arms. The juglar venous pulse was not elevated, and there were no murmurs or gallops. The neck was supple. A few expiratory wheezes were noted bilaterally, but no rales or dullness were present. The uterus was enlarged to the level of the umbilicus, and the fetal heart tones were present at a rate of 160/min. There was slight tenderness over the right upper quadrant but no other organs or masses were palpable. Pelvic examination was unremarkable. There was moderate ankle edema. The optic fundi showed probable papilledema. The reflexes were brisk and equal, and the plantar responses were flexor. The remainder of the physical examination was within normal limits.

Urinalysis gave a 3-plus test for protein, a 1-plus test for blood, and was negative for sugar and acetone. Examination of the sediment revealed 5-10 white cells per high power field, occasional red blood cells and many hyaline and granular casts; no red cell cast were noted. The hematocrit was 50%, white cell count 21,300/cmm with 72% polymorphs and 7% lymphocytes. Platelet count was noted to be average, and the blood smear was unremarkable. The blood urea nitrogen was 9 mg%, creatinine 1.0 mg%; serum sodium 133, potassium 5.1, chloride 105, CO_2 8 mEq/liter. The urine gave a negative test for porphobilinogen. ASOT titre was 100 Todd units. Sputum culture was negative.

She was treated with intravenous fluids, magnesium sulfate and valium. Over the succeeding twelve hours the urine output was adequate, but

*The following physicians have been appointed to serve on the Maternal Mortality Committee, a subcommittee under Maternal and Child Health: Horace E. Thompson, Chairman, E. N. Akers, Maxwell A. Abelman, L. Joseph Butterfield, Warren E. Cooper, Gerald W. Del Junco, Lawrence W. Roessing, all of Denver; John H. Darst, Greeley; Harold L. Dyer, Colorado Springs; Richard R. Hansen, Fort Collins; Ronald E. Harrington, Boulder; James R. Patterson, Englewood; Louis C. Wollenweber, Jr., Lakewood.

her sensorium was clouded and she remained hypertensive with diastolic blood pressures in the range of 120-140 mm Hg. The fibrinogen was 605 mg%, but the platelet count fell to 73,000/cmm. Blood pressure was controlled with hydrallazine, but the platelet count subsequently fell to 17,000/cmm. Twelve hours after admission the membranes were ruptured, and a 1290 gm stillborn fetus was delivered twelve hours later, following pitocin infusion.

Forty-five minutes following delivery the blood pressure was found to be 40 systolic; the pupils were dilated and fixed and she was intubated and transferred to the medical service. Blood gas determination showed pH of 7.26, PCO_2 25, PO_2 75 mm Hg. Despite vigorous pressor therapy, heparin, massive doses of steroids, diuretics and assisted ventilation, she remained hypotensive, oliguric and areflexic. She died two days after transfer.

An autopsy was done and the findings were severe chronic bronchial asthma, severe brain swelling, hemorrhages in the liver and, endothial swelling of glomeruli, secondary to toxemia. •

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INTRAUTERINE DIAGNOSIS

Recently there have been two editorials, one in the March 12 issue of *New England Journal of Medicine* by Dr. John Littlefield, and the other in the February issue of *Archives of Environmental Health* by Dr. Robert Cooke, as well as a Medical Progress article in the February issue of *California Medicine* on recent advances in intrauterine diagnosis for chromosomal and metabolic disorders. There are a large number of such inborn errors of metabolism which can be diagnosed by amniocentesis. Each requires special procedures and techniques, so that no single center can be expected to be fully proficient to perform all possible tests. The first two gentlemen pointed out the need for establishing a director or registry of centers identified with the procedure or disorders they are competent to undertake. We have had the same concern and indeed decided to establish a registry of amniocentesis capabilities in the Western States. A survey was conducted of Centers and investigators wishing to participate in a collaborative effort to pool amniocentesis resources were invited to submit a list of the capabilities of their group. An essentially unedited compilation was made. The "Western States Amniocentesis Registry" which evolved contains a listing by Center and investigator identified with cytogenetic or biochemical capabilities and contact addresses and telephone numbers. At this writing, the Registry has just been completed and is being distributed to the participants. Since additional procedures are being tested and new capabilities will be acquired, an updated master file will be maintained at Pacific State Hospital.

Those who may have occasion to avail themselves of the services should contact Hayato Kihara, Ph.D., Chief Research Biochemist, Pacific State Hospital, Box 100, Pomona, Calif. 91766.

A medical potpourri

Compiled by Andrew M. Babey, MD, Las Cruces, New Mexico

1. "More emphasis is needed, however, on the fact that hypercalcemia which has been clearly present for a period of time may disappear and be impossible to demonstrate, even for months, in some patients with hyperparathyroidism." JOHNSON, Robert and CONN, Jerome, Hyperparathyroidism, JAMA, Dec. 15, 1969, p. 2063.

2. "Although the half-life of medical knowledge is said to be steadily decreasing (it is now estimated by some to be a scant five years), there is that in the art of medicine which is timeless. When this essential quality is subjected to more than casual scrutiny, its essence seems to consist of that juxtaposition of bits of data which makes the entire array seem to make sense." ROME, Howard P., Speaking Out, *Medical Insight,* Dec. 1969, p. 8.

3. "Heparin, with a molecular weight of 20,000, does not cross the placenta and is without known risk to the fetus. In contrast, coumarins (M.W. 1,000) do cross the placenta and are associated with 18 per cent fetal mortality. It may therefore be questioned whether coumarin derivatives, which may result in fetal abnormality as well as death from haemorrhage before and during labour, should ever be given during pregnancy." Leading Articles, British Medical Journal, January 31, 1970, p. 250.

4. "The early views that urologic hyperparathyroidism would inevitably produce severe recurrent nephrolithiasis and later progress to clinical bone disease have not been corroborated. Many patients with urologic manifestations have stones intermittently, often only once. Lloyd suggested that HPT with osetitis fibrosa cystica and HPT with nephrolithiasis constitute distinct entities which seldom overlap. He described the former as characterized by shorter duration, rapidly growing tumors, and more severe hypercalcemia and the latter, by longer duration, slower growing lesions, and mild hypercalcemia." KEATING, Raymond F., Jr., The Clinical Problem of Primary Hyperparathyroidism, The Medical Clinics of North America, March 1970, p. 513.

5. "Except for a brief period in 1956 when she had a single episode of active peptic ulcer and was found to have four kidney stones, the patient's condition can be aptly described as "asymptomatic chemical hyperparathyroidism without clinical manifestations." Particularly striking in this case and in many others is the remarkable stability of the hypercalcemia over an extended period." Ibid., p. 514.

6. "Patients with normal or minimally increased serum calcium levels may, in some circumstances, suffer serious and potentially fatal exacerbations. Although such incidents have been documented infrequently, it must be recognized that at present there is no reliable means of anticipating them or of estimating their real frequency." Ibid., p. 514.

7. "There is no syndrome or combination of symptoms or clinical conditions which uniquely characterizes this disorder." Ibid., p. 515.

8. "Chemical hyperparathyroidism without symptoms.' No indication existed in the history, either initially or subsequently, for ordering the calcium studies except as routine screening procedures." Ibid., p. 517.

9. "HPT can usually be defined as hypercalcemia for which alternative causes have been excluded. . . . The first diagnostic chore is to corroborate the occurrence of hypercalcemia by repeated estimations, to be sure it is genuine to exclude misleading artifacts and to determine its varibility." Ibid., p. 518.

10: "It has proved useful to do electrophoretic analysis of plasma proteins on all hypercalcemic patients because variations of protein constituents account for some perturbations of total serum calcium values. Proteins studies are of particular value in excluding myeloma or sarcoid; these frequently cause hypercalcemia, at times closely mimic it, and occasionally accompany it. It is to the evaluation of patients with normal, borderline, or cyclically variable calcium levels, as well as those with unusual or no clinical features, that other tests of parathyroid function are particularly directed." Ibid., p. 520-521.

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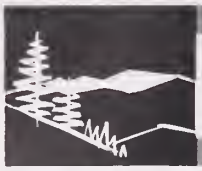

COLORADO

Colorado's President-elect

Kenneth A. Platt, MD, who is in the general practice of medicine in Westminster, Colorado, was named President-elect of the Colorado Medical Society at its 100th Annual Session in Colorado Springs.

Born October 14, 1923, Dr. Platt is a native of Denver and was educated in the Denver Public Schools. He attended the Ohio State University and Denver University.

He entered military service in 1943 and after discharge in 1946 attended the University of Colorado School of Medicine where he obtained his M.D. degree in 1950. He returned to the service in 1950, serving in the Korean War and was discharged again in 1953, at which time he established medical practice in Westminster. Dr. Platt was awarded the Bronze Star and commendation for service during the Korean War.

Dr. Platt has served on numerous committees and as a member of the Board of Trustees of the Colorado Medical Society. In 1959, he served a term as president of the Clear Creek Valley Medical Society. He holds an Active staff membership at St. Anthony's Hospital, (where he was Chief of Staff in 1961-62) an Associate membership at Lutheran Hospital, and Courtesy memberships at Children's Hospital and St. Luke's Hospital.

For the past eight years, he has been a member of the District 50 School Board, serving as president for the last two years. In January of this year, he was the recipient of the Distinguished Service Award presented by the Westminster Jaycees "for the betterment of the community for his efforts in bringing a hospital to the area," and was also awarded the Westminster and District 50 Chamber of Commerce Award in recognition of "outstanding service with distinction to the Westminster and District 50 Community."

In 1947, Dr. Platt married Margaret E. Sullenberger. They have two daughters and a son.

Installation as President of the Society will occur at the 101st Annual Session next September.

Greeley Doctor Appointed Deputy Chief of Staff For S.S. HOPE West Indies Mission

Dr. William B. Walsh, founder and President of Project HOPE, has announced that Phillip David Weaver, M.D., of Greeley, has been appointed Deputy Chief of Staff and Chief of Radiology aboard the hospital ship S.S. HOPE for its 1971 West Indies mission.

Dr. Weaver is chief of Radiology at Weld County General Hospital and a member of the Weld County Medical Society, the Colorado Medical Society, the Colorado Radiological Society, and the Rocky Mountain Radiological Society, as well as other national medical and radiological societies.

In January 1971, the S.S. HOPE will sail to Kingston, Jamaica, for ten months on its ninth teaching/treatment mission since 1960. The West Indies mission marks the beginning of HOPE's second decade of service and the start of a three-year hemispheric program. Missions will follow to Brazil (1972) and Venezuela (1973).

The decision to send the hospital ship to Jamaica came in response to an invitation extended by the Ministry of Health through its chief medical officer.

Dr. Walsh stressed that HOPE's decision to conduct the first phase of its hemispheric program in the West Indies "will help reach the people, not only of Jamaica, but of other island republics that have tended to feel that we in the United States have neglected them."

HOPE medical survey teams report that the health care system in the Caribbean area is as needy as any that HOPE had encountered in the world.

The University of the West Indies School of Medicine is responsible for the training of students from the island republics, including Jamaica, Trinidad, and Barbados. The faculty, though small in number, is top-level, but there is a great shortage of trained and competent medical personnel through the Caribbean.

The S.S. HOPE is presently undergoing repair and resupply at Baltimore, Maryland, after returning recently from a ten-month medical teaching mission in Tunisia.

Project HOPE (The People-to-People Health Foundation, Inc.) is a private non-profit corporation headquartered in Washington, D.C., and supported by the American people. Since 1960 the S.S. HOPE has conducted medical teaching and exchange programs in Indonesia, South Vietnam, Guinea, Peru, Ecuador, Nicaragua, Colombia, Ceylon, and Tunisia. Shore-based programs continue today in six of these nations.

In the spring of 1969, HOPE began two health career training programs at home—one in the Mexican-American community of Laredo, Texas, and another on the 16-million acre Navajo reservation at Ganado, Arizona.

* * * * *

Cold Sensitivity Treatment Found

An apparently effective treatment of cold sensitivity in humans was revealed during a recent study of this condition by a team of physicians working at National Jewish Hospital and Research Center at Denver. Cold sensitivity simply is an allergy to cold temperatures which produces hives on the body and can induce shock in an individual with the allergy, possibly resulting in death.

The study affirms that some patients have a factor in their blood, which when injected into a normal individual, can transfer the cold sensitivity to them. Apparently, he said, this blood factor belongs to a class of immunoglobulin (proteins in blood which carry antibody activity) which has not previously been associated with the induction of this allergic disorder. The team believes this form of cold sensitivity is more common than previously recognized, and predicted that it is a problem nearly every physician in general practice will encounter.

* * * * *

Training Program in Nursing Care

The American Medical Center at Denver, a national hospital for cancer treatment, research, and education, has received a three year federal grant from the Colorado-Wyoming Regional Medical Program to institute a training program for nurses caring for cancer patients. The grant, received through the Denver based C-WRMP, will enable AMCD to offer an intensive program in in-service training to nurses, particularly those in supervisory positions, from institutions treating cancer patients from throughout Colorado and Wyoming.

Purpose of the training program is to develop a nucleus of nurses with current knowledge and clinical experience in cancer nursing and chemotherapeutic agents (drugs, chemicals, and hormones used in treating cancer).

The program will be expanded in the two following years, provided that additional funds are made available. The first year's grant is in the amount of $15,700.

The American Medical Center at Denver is a national hospital providing its services free to all in need. AMCD programs are supported almost entirely through charitable gifts and contributions from individuals and organizations and is one of the few hospitals in the country offering long-term treatment for patients with advanced cancer in all its forms. Cancer research at the AMCD is coordinated through the National Cancer Institute with other institutions around the country. AMCD educational programs and conferences inform medical professionals from all parts of the United States of the latest advances in the fight against cancer.

MONTANA

Indian Nurse Award Winner Honored at AMA Meeting

Miss Audra Pambrun, R.N., a native of Browning, Montana, a frontier town near Glacier National Park, and a member of the Blackfoot Indian tribe, was honored by the American Medical Association.

A resolution, extolling her "unselfish" and unparalleled contributions in promoting health care and multiple health services among a forgotten people" was adopted unanimously by the AMA House of Delegates after it was introduced by the Montana Medical Association.

Miss Pambrun was selected from 39 state finalists as America's most BE-INvolved Nurse, and was so honored recently by the American Nurses Association and Schering Laboratories. She and her 20 health aides for the Office of Economic Opportunity Community Action Program promote health and medical care among the 7,000 Blackfoot Indians on a 1,500,000-acre reservation in Montana.

The resolution said she "serves her Blackfoot people with dedication, loyalty and compassion in such programs as health education, immunization, eye screening, hearing, accident prevention and sanitation." She drives 2,000 miles a month to counsel and help Indians and non-Indians in their homes on the reservation. After the resolution was adopted, Miss Pambrun was introduced before the House of Delegates and told members in her response that "priorities on the reservation's health front are mental health, accident prevention, maternal and child health services and geriatrics."

Miss Pambrun, who was graduated from Columbus Hospital School of Nursing at Great Falls, the second of her tribe to wear the nursing cap, solicited support from community groups and was instrumental in establishing Montana's first suicide intervention crisis center in May, 1969, in a strong effort to reduce the suicide rate among young Blackfoot Indians, which is 47 per cent higher than the national rate.

* * * * *

Dr. Bowman Appointed to WICHE Commission

Montana Governor Forrest H. Anderson has appointed Warren D. Bowman, Jr., M.D., to the WICHE Commission. Dr. Bowman is a member, Department of Internal Medicine, Billings Clinic. He replaces Richard S. Buker, M.D., of Chester.

NEW MEXICO

Calendar "Clearinghouse"

Because of New Mexico's growing importance as a health center for the Southwest, more and more medical seminars and conferences are being scheduled each month—and often overlap each other.

In an effort to help medical workers in the state, the New Mexico Regional Medical Program has started a calendar "clearinghouse" for all health education programs to avoid having major medical programs on the same dates. The need was made especially apparent recently when three major medical meetings, on orthopedics, epilepsy and kidney stones, were announced for the same dates in mid-October.

Any medical or health professional or paraprofessional group planning a workshop, seminar or other meeting is asked to contact Mrs. Liz Barnett at the Regional Medical Program on the University of New Mexico medical campus, phone 277-4907 or 277-2410.

Also, any groups trying to pick a good date for a meeting can check with Mrs. Barnett to see which days already have meetings scheduled. A calendar is being planned which will be mailed to physicians quarterly. The service by Regional Medical Program is being provided without charge to all health groups in the state.

UTAH

Robins Award Winner

John A. Dixon, MD, a prominent Ogden, Utah, surgeon and newly appointed executive vice president at the University of Utah, has been selected by the Utah State Medical Association's Board of Trustees to receive the 1970 A. H. Robins Community Service Award. The honor is given annually to a Utah physician on the basis of service to the community in matters outside the realm of normal medical pursuits and responsibilities.

Dr. Dixon has been serving as director of the University Surgical Service at McKay-Dee Hospital Center in Ogden, where he chaired a hospital planning committee concerned with fund-raising and construction of the recently completed $12 million complex. Included in his civic activities are memberships on the Ogden City Council, Ogden City Charter Review Commission and Ogden Retail Merchants Credit Bureau.

A graduate of the University of Utah, where he also earned his M.D. degree in 1947, Dr. Dixon is a former University Regent (1963-66) and has held teaching posts in the College of Medicine since 1954. His new assignment as executive vice president also includes a faculty appointment as professor of surgery.

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MEDICAL SCHOOL NOTES

University of Colorado Medical Center

Dr. John J. Conger, University of Colorado vice president for medical affairs, has been appointed to the Advisory Committee on Undergraduate Medical Education of the American Medical Assn. The 10-man committee is advisory to the AMA's standing Council on Medical Education, of which Kenneth C. Sawyer, MD, Denver, is vice chairman. Charged with reviewing and making recommendations on the activities of the council, the committee also has responsibilities in identifying the needs and problems of U. S. medical schools, in reviewing accreditation procedures for the schools, and advising on health legislation affecting medical education.

* * * * *

Dr. Thomas E. Starzl, professor of surgery in the University of Colorado School of Medicine and chief of the surgical service at the Denver Veterans Administration Hospital, has been awarded the first international Eppinger Prize for "outstanding contributions which have advanced the knowledge of liver disease." The prize was awarded in Freiburg, West Germany, at the opening of an International Conference on Alcohol and the Liver sponsored by the University of Freiburg. The award committee included authorities from Germany, Italy, the United States and England.

Dr. Starzl was honored for his pioneering work in the surgical transplantation of the liver. To date, Dr. Starzl and his associates at the CU Medical Center have given transplanted livers to 44 terminal patients in a series of operations dating back to 1963 at Colorado General and the Denver VA Hospitals. Two of the liver transplant operations were undertaken within the past month. Six of the patients are living, and six have survived at least one year following the surgery. The Eppinger Prize (named for Dr. Hans Eppinger, distinguished European specialist in diseases of the liver) is the latest in a series of honors which have come to Dr. Starzl for his achievements in transplant surgery. He has received honorary Doctor of Science degrees from his alma mater, Westminster College in Fulton, Mo., and the New York Medical College, and he was chosen for the prize of the Societe Internationale de Chirurgie for the "most outstanding contribution to surgical science in 1963-65." He is also recipient of the William S. Middleton Award from the Veterans Administration, the Modern Medicine Distinguished Achievement Award, the achievement award of Lund University and the Malmo Surgical Society in Sweden, and the merit award of Northwestern University where he earned M.D. and Ph.D. degrees in 1952.

* * * * *

The artificial kidney has been a life-saver for many patients afflicted with chronic renal kidney disease and for victims of poisonings. But when the patient is an infant or small child, hemodialysis on the kidney machine is dangerous and technically very difficult.

Because of the research efforts at the University of Colorado Medical Center the risks of treating children by hemodialysis can be greatly reduced by a technic which controls precisely the rate of blood removal and return so there is no change in the blood volume during the dialysis period. Research was aided by a $2,500 grant from the Kidney Foundation of the Rocky Mountain Region and the Medical Center's general research support funds.

The Medical Center is ready and willing to begin dialyzing small children, but does not have the proper facility at the Medical Center yet. There is no pediatric dialysis center in Colorado, and to our knowledge, none in the Rocky Mountain area. The Medical Center does have the expertise to operate such a center, but does not have the funds needed to equip, staff and operate the facility.

At least $5,000 would be required to equip a dialysis center for children because of the many safety features required, including the precision scales and monitoring equipment similar to that found in an intensive care unit.

* * * * *

James E. Strain, MD, Denver pediatrician, has been elected 1970 president of the Medical Board of the University of Colorado Hospitals to succeed Edward G. Billings, MD. Doctor Strain is an associate clinical professor of pediatrics on the volunteer faculty of the CU School of Medicine, with which he has been affiliated since 1950. He was elected president by the 16-member board which represents the volunteer and full-time physicians who staff Colorado General and Colorado Psychiatric Hospitals at the CU Medical Center.

Appointed to the CU medical faculty in 1950 as a clinical assistant in pediatrics, he was promoted to clinical instructor in 1953 and to assistant clinical professor in 1957. He is a diplomate of the American Board of Pediatrics and holds active staff appointments at Children's and St. Joseph Hospitals in addition to Colorado General, and honorary staff appointments at Presbyterian, St. Luke's and St. Anthony's Hospitals. Doctor Strain is active in the affairs of the Denver and Colorado Medical Societies and the Rocky Mountain Pediatric Society. He is also a member of the Governor's Colorado State Medical Services Advisory Council.

Elected as vice president was Jerry K. Aikawa, MD, professor of medicine and director of the central laboratories at the Medical Center. Don L. Arnwine, director of University hospitals, serves ex-officio as secretary of the board.

* * * * *

Mrs. Alice Feller of Aspen, widow of the late Abraham H. Feller, the first General Counsel of the United Nations, has presented a gift of $15,000 to the University of Colorado Medical Center to assist in equipping a new laboratory for cancer research.

The laboratory will not only undertake original investigations into the cellular biology of cancer, but will also provide laboratory support to the Bonfils Tumor Clinic, established at the medical center in 1941 as a diagnostic, research and educational facility and currently an affiliate of the National Cancer Chemotherapy Study Program.

University of Nevada School of Medical Sciences

Dr. Dan L. Oppleman, professor of education at the University of Northern Iowa since 1963, has joined the faculty of the School of Medical Sciences as director of the Educational Support Division.

The new faculty member has been engaged in experimental work with audio-visual and other media, particularly closed circuit television, since he was on the faculty at Central Washington College from 1953 to 1959. He has also been active as a consultant in curriculum development and urban education, was director of the Great Plains Core Conference covering seven states, and has published numerous articles in his field.

Dr. Oppleman was born at Lynchburg, Va. He received his bachelor's degree from Lynchburg College, and his master's and doctor's from Peabody College in Nashville, Tenn. He was formerly head of the department of education and psychology at Iowa Wesleyan College, and has taught at several other colleges and universities.

University of New Mexico School of Medicine

Students from almost every quadrant of New Mexico have enrolled in the current class of Medical Laboratory Assistants at University of New Mexico School of Medicine. The course, sponsored by Regional Medical Program and designed to provide more skilled medical workers in New Mexico, consists of six months of training at the medical school and another six months working in the students' home town hospital or medical laboratory. The one-year course, offered to high school graduates, prepares them for positions in clinical and hospital laboratories as technical assistants. They will perform certain chemical, hematological and microbiological tests under the supervision of medical technologists, physicians, and other laboratory professionals.

* * * * *

A specialized two-year study on how food intake affects kidney development, and other factors regulating kidney function, is underway at University of New Mexico School of Medicine. Dr. Sidney Solomon, chairman of the medical school's Department of Physiology, is director of the $95,000 grant from the National Science Foundation to study "renal function in neonatal rats."

Dr. Solomon also is studying kidney acid secretion under a grant from the American Heart Association—a project made possible by his development of a special analytical technique for measuring acid concentration in a very small droplet of fluid.

The professor returned to UNM last September after a year's leave of absence to serve as program director of metabolic biology for the National Science Foundation in Washington D.C.

"We know very little about this area," Dr. Solomon said. "In our laboratories we have been able to establish that food intake limits the functional development of the kidney. By making more food available, to young rats, we find they not only grow bigger, but the regulatory function of the kidney develops in proportion."

He said 20-day-old rats can have kidneys as developed as 30-day-old rats who have been on limited food intake.

"Changing the functional demands on the kidney may affect how the kidney develops morphologically," Dr. Solomon said.

* * * * *

Cholesterol has become a "no-no" in recent years for many people, since many medical investigators have suggested that cholesterol may be important in explaining heart attacks caused by "hardening of the arteries." But studies at University of New Mexico School of Medicine may shed new light on this problem.

Dr. Terence J. Scallen, assistant professor of biochemistry, has received a $33,000 grant from the Life Insurance Medical Research Fund, to be spread over a three-year period.

Dr. Scallen's research involves a new protein material, found in his laboratory through experiments which has the ability to stimulate cholesterol formation. By understanding how cholesterol is made, scientists may learn more about controlling it.

"Cholesterol is part of the structure of every living cell in the human body," the doctor said. "In short, it is a normal component of healthy human beings, an essential chemical for life in man."

Mrs. Margo Schuster, who holds a master of science degree from Cornell University, has been the principal collaborator with Dr. Scallen on the research project since June of 1967. Also working on the project are Dr. A. K. Dhor and Dr. Harold Skrdlant post-doctoral fellows; Eric Manley, graduate student; and Dr. Margaret Ackerman who will soon join the group as a postdoctoral fellow.

Fifty future doctors entered the University of New Mexico School of Medicine this September—and 32 of the new students are New Mexico residents.

The medical school begins its seventh year of teaching this fall. For the past two years, only 36 new students per year have been admitted. The 50 new students in the Class of 1974 bring the total student body enrollment to more than 150 future doctors.

* * * * *

A computer service which lists potential kidney donors throughout the United States and Canada soon will be hooked up to the kidney transplant program at the University of New Mexico School of Medicine.

The computer, called the National Communications Network, is located at the University of California at Los Angeles. It can direct organs of an accident victim to a recipient across the continent. The first national listing in April contained 331 prospective kidney recipients from 36 transplant centers. The June listing increased to 534 prospective recipients from 46 centers.

In the past year, 240 donors were referred by the computer, and 102 transplants were performed nationwide.

About one person in 200 is an ideal match for an organ from another unrelated individual. The ratio is one in four among brothers and sisters.

Transplants from donors immediately related to the recipient have a success rate after two years of about 95 per cent. Organs donated by nonrelated persons do not have as successful a transplant rate—50 to 60 per cent several years ago—but this is constantly improving as advances in white cell typing, surgery, storage and anti-rejection technics are improved.

University of Utah Medical Center

William J. Kolff, MD, Chairman of the Division of Artificial Organs at the University of Utah College of Medicine, and famous for his development of the world's first artificial kidney, has been awarded the Rank of Commander in the Order of Oranje-Nassau by Her Majesty, Queen Juliana of the Netherlands.

In ceremonies at the College of Medicine, Dr. Kolff received official recognition to accompany presentation of the Medal of Achievement which he received earlier this year in his native Holland. This award is the highest tribute for accomplishment in the field of science that can be conferred by the Government of the Netherlands upon a native of that country. It is equivalent to being knighted. Membership in the Order of Oranje-Nassau is usually reserved only for residents living in Holland. Recognition of Dr. Kolff is the first such award to be presented to an individual living in the United States.

* * * * *

Distinguished Professor of Internal Medicine at the University of Utah College of Medicine, Maxwell W. Wintrobe, MD, has become the first recipient of the "Distinguished Internist Award" of the Utah Society of Internal Medicine.

Dr. Wintrobe came to Utah in 1944 from Johns Hopkins University to organize a Department of Internal Medicine at the new University of Utah four-year College of Medicine. An internationally recognized authority in the field of Hematology, he developed the Department of Internal Medicine into one of the finest in the country. The award is to specifically honor Dr. Wintrobe for his contributions to Internal Medicine in the State of Utah.

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OBITUARIES

Colorado

Henry Troy Earhart, MD, who for 31 years practiced as a general surgeon in Denver, died October 7 at the age of 56.

He was born September 17, 1914 in Mulberry, Indiana and educated in that state, receiving his M.D. degree from the University of Indiana in 1939. He interned at Presbyterian Hospital in Denver and later became associated with Dr. George B. Kent in the practice of general surgery.

From March 1941 to March 1946, he was attached to the 29th Evacuation Hospital with the rank of lieutenant-colonel. Following discharge from service, he resumed his practice in Denver where he remained until his recent retirement to Del Norte, Colorado.

Doctor Earhart was a member of the American Society of Abdominal Surgeons, the Denver and Colorado Medical Societies, and the American Medical Association.

Surviving are his wife, Pearl; a daughter, Mrs. Susan London of College Station, Texas; two sons, Mark E., serving in Viet Nam and H. Douglas of Denver; and a step-brother, John Farner of Phoenix, Arizona.

Ralph Wesley Danielson, MD, was born in Basalt, Colorado of second generation Swedish parents. He attended the Colorado State Preparatory School, now Boulder High School, and later the University of Colorado. His university career was interrupted by a World War I tour in the army, and much of this time was spent at Ft. Lewis, Washington nursing the then prevalent influenza. His own illness was complicated by nephritis which left sequellae which persisted.

After returning from army duty he completed his university work and studied medicine, receiving an M.D. degree in 1923. He was married to Miss Luverne Langley, a fellow university student, on June 10, 1922. Following graduation he interned at Denver General Hospital and then entered a very active and interesting practice in the copper mining town of Santa Rita, New Mexico, where he also acquired an interest in the Mexican-Americans and some familiarity with the Spanish language.

After two years as a graduate student at the University of Colorado he received the degree of Doctor of Ophthalmology and started the practice of ophthalmic surgery in an office in the Metropolitan Building in Denver. In 1936, in spite of the fact that the economics of the country were severely depressed, Doctor Danielson found it necessary to acquire an associate. This partnership lasted for over 33 years; possibly a record in this state.

He was an enthusiastic supporter of the University of Colorado and served as clinical professor and head of the Department of Ophthalmology for seven years. In addition, he contributed financially and otherwise to the library and other branches of the school. He was granted the Colorado Alumni Award in 1944 and the Medical School Alumni award in 1952. His son, Philip, served on the Board of Regents from 1960 to 1966.

Doctor Danielson belonged to a number of professional and civic organizations including the Clinical and Pathological Society, the Colorado Ophthalmological Society and the medical staffs at Children's Hospital and the Colorado General Hospital. He held the office of president of Big Brothers, Inc. He served as chairman of the Advisory Council for Ophthalmic Surgery of the American College of Surgeons. In 1956 he joined by invitation the prestigious American Ophthalmological Society.

His extraprofessional activities centered around his family and friends. He was enthusiastic about intercollegiate football and was one of the most skilled dry-fly trout fisherman of the state, as he would modestly admit. He was an expert on Western history and in 1965 published, with his brother Clarence, a history of Basalt, his home town. He was in the process of revising this book, the first edition having sold out, when he was fatally stricken.

A crushing tragedy was the sudden death of son Philip in 1968. Doctor Danielson is survived by his wife, Luverne; a brother, Clarence; a daughter, Mrs. Leonard Kowalski; a daughter-in-law, Mrs. Philip Danielson and seven grandchildren.

John C. Long, M.D.

Major General Howard McC. Snyder, USA (Ret.) an Honorary Member of the Colorado Medical Society since 1956 died Tuesday September 22 at the age of 89 at Walter Reed Hospital. During the last eight years of his more than fifty years of active duty in the Army Medical Corps, he was personal physician to the late President Dwight D. Eisenhower.

General Snyder's first experience in military medicine was as a contract surgeon at Fort Douglas, Utah in 1907. The following year he graduated with honors from the Army Medical School in Washington, D.C. and was appointed 1st Lieutenant in the Medical Corps, U. S. Army.

Among many recognitions of General Snyder's service, the honor which may well have meant most to him was his election as honorary member of the class of 1929 at the U.S. Military Academy at West Point. He was one of only three men so honored in the first 127 years of West Point's history. It was during that period that Doctor Snyder became one of the first U.S. surgeons to perform the now common cartilage operation in treatment of "football knee" injuries. General Snyder was awarded the Distinguished Service Medal for his service as Medical Inspector General of the United States Army during World War II, and the Legion of Merit for his services as physician to President Eisenhower.

General Snyder was born in Cheyenne, Wyoming on February 7, 1881, the son of a pioneer settler family. His lifelong love and knowledge of horses dates from days when he worked his way through college at the University of Colorado as a cattle puncher. Graduating in 1902, he went to Jefferson Medical College in Philadelphia, where he graduated with honors and received his degree in medicine in 1907.

General Snyder's first overseas military assignment was in the Philippine Islands, where in 1910 he met and married Alice Elizabeth Concklin, who survives him. His two sons, Major General Howard McC. Snyder, Jr., USA (Ret.) and Colonel Richard C. Snyder, USAF (Ret.) are both West Point graduates. The eldest of his six grandsons, Howard McC. Snyder III, graduated from Harvard Medical School in June 1969.

General Snyder's tireless readiness to assist others frequently took him outside the normal bounds of military medical service. Ministering to victims of the San Francisco earthquake and fires in 1908 provided an early test of Doctor Snyder's medical skills. During the influenza epidemic of 1918-19, he was responsible for treatment of a greater number of influenza cases than any doctor in the history of medicine.

General Snyder reached statutory military retirement age in February 1945 but was retained on active military duty, being assigned as a member of the Advisory Group to the Chief of Staff, U. S. Army, following World War II. He went into retired status in 1948 but in 1951 was recalled to active duty as Senior Medical Officer, SHAPE, and Special Advisor to then General of the Army Eisenhower during the years Eisenhower was Supreme Commander, Allied Powers, Europe.

In addition to General Snyder's numerous U. S. Awards, in 1943 he was awarded the decoration of Grand Officer, Order of Ouissam Alaouite by the Sultan of Morocco. General Snyder also held the decoration of Grand Commander, Order of the Southern Cross and the Brazilian War Medal, both awarded by the President of Brazil.

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Leland Marchant Corliss, MD, died September 18, 1970 of a heart attack while vacationing in Maine.

Born in Gloucester, Massachusetts July 5, 1905, he attended the Massachusetts Public Schools, Tufts Pre-Medical School and Tufts College of Medicine from which he received his MD in 1932. After an internship at Memorial Hospital in Worchester, Mass., Doctor Corliss did postgraduate work in surgery at the Royal Infirmary, University of Edinburgh, Scotland, and took his residency at the New England Medical Center, Boston. He later entered private practice in West Paris, Maine.

During World War II, Doctor Corliss was a lieutenant-commander in the U.S. Navy Medical Corps. He saw action in North Africa, Sicily and Italy and was later assigned to the English Channel area where he was chief surgeon on a group of 36 ships. Doctor Corliss was injured twice, once on D-Day plus one when a land mine exploded, and again more seriously on his 77th crossing of the Channel.

Doctor Corliss joined the Denver Public Schools as a physician in April, 1948 and was named Director of Health Services the following year. He was president of the American School Health Association from 1960-61, Director of the Meridian Mutual Fund, Inc. and a member of the Board of Directors. He was a member of the Colorado Chapter of the American Cancer Society, the Colorado Society for the Prevention of Blindness, the Colorado Heart Association, the Colorado Public Health Association, the International Union for Health Education, the World Health Association, the National Education Association, the Colorado Education Association, and the Colorado School Masters. He was also a member of the AMA, the Maine Medical Society, the Massachusetts Medical Society, the Colorado Medical Society and the Denver Medical Society.

Doctor Corliss is survived by his wife, Eleanor, and a son, Gardner, of Denver.

Montana

Ralph Leonard Towne, MD, formerly of Kalispell, died in Portland, Oregon, on March 15, 1970.

Doctor Towne was born in Hamilton, Missouri, on February 3, 1895. He received a B.A. degree from Park College in 1918 and his M.D. degree from the University of Kansas School of Medicine in 1923. Upon completion of his internship he moved to Kalispell for the practice of general surgery where he continued the practice of medicine until his retirement in 1966. He was very active in community affairs in Kalispell and in Flathead County. He also served as a member of many committees of his component medical society and of the Montana Medical Association.

Utah

Earl R. Crowder, MD, retired Salt Lake radiologist, died September 14, 1970, at the age of 71.

Doctor Crowder was born March 18, 1899, in Elk Point, South Dakota. He graduated from the University of South Dakota in 1923 with a B.S. degree and received his M.D. degree in 1925 from the University of Nebraska, where he also completed his internship. Following three years of medical practice in Worland, Wyoming, Doctor Crowder moved to Chicago for training in radiology at Passavant Hospital. After graduate training, he was appointed to the faculty of Northwestern University. He later became head of the Department of Radiology at Evanston Hospital in Evanston, Illinois. During World War II, Doctor Crowder served with the Army Medical corps in the Mediterranean theater. After the war he moved to Salt Lake City, where he became head of the Department of Radiology at the Latter-day Saints Hospital. He retired from practice in 1966. Doctor Crowder was a member of the Salt Lake County, Utah State, and American Medical Associations. He was also a member of the Radiologic Society of North America, and the American Board of Radiology.

His survivors include his widow, Mable, and one brother, Dr. Robert M. Crowder, both of Salt Lake City.

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THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Acute Renal Failure; Diagnosis and Management: By Robert C. Muehrcke. St. Louis, 1969, Mosby. 343 p. Price: $19.75.

Anatomy for Anaesthetists: By Harold Ellis and Margaret McLarty. 2nd ed. Philadelphia, 1968, Davis. 342 p. Price: $10.00.

Atlas of Arteriography In Occlusive Cerebrovascular Disease: By Jorge Weibel. Philadelphia, 1969, Saunders. 190 p. Price: Not set.

Atlas of Nuclear Medicine: By Frank H. DeLand and Henry N. Wagner. Philadelphia, 1969, Saunders. 217 p. Price: $18.00.

Basic Clinical Parasitology: By Harold W. Brown. 3rd ed. New York, 1969, Appleton. 345 p. Price: $9.50.

Bedside Diagnostic Examination: By Elmer Louis DeGowin and Richard L. DeGowin. 2nd ed. New York, 1969, MacMillan. 923 p. Price: $9.95.

Biochemistry; A Functional Approach: By R. W. McGilvery. Philadelphia, 1970, Saunders. 769 p. Price: Not set.

Bleeding Problems In Clinical Medicine: By Armand J. Quick. Philadelphia, 1970, Saunders. 225 p. Price: $9.50.

Clinical Neuro-Ophthalmology: By Frank B. Walsh and William F. Hoyt. 3rd ed. Baltimore, 1969, Williams & Wilkins. 3 vols. Price: $120.00.

Clinical Toxicology: By C. J. Polson and R. N. Tattersall. 2nd ed. Philadelphia, 1969, Lippincott. 655 p. Price: $18.50.

Diagnosis of Diseases of the Chest: By Robert C. Fraser and J. A. Pare. Philadelphia, 1970, Saunders. 1388 p. Price: $48.00.

Differential Diagnosis; The Interpretation of Clinical Evidence: By A. McGehee Harvey and James Bordley III. 2nd ed. Philadelphia, 1970, Saunders. 1238 p. Price: $27.00.

Diseases of The Colon and Anorectum: Edited by Robert Turell. 2nd ed. Philadelphia, 1969, Saunders. 1340 p. Price: $65.00.

Diseases of The Liver and Biliary System: By Sheila Sherlock. 4th ed. Philadelphia, 1968, Davis. 809 p. Price: $18.50.

Emergency Treatment and Management: By Thomas Flint and Harvey D. Cain. 4th ed. Philadelphia, 1970, Saunders. 733 p. Price: $13.50.

Fundamentals of Clinical Chemistry: Edited by Norbert W. Tietz. Philadelphia, 1970, Saunders. 983 p. Price: $26.00.

General Principles of Blood Transfusion: By American Medical Association. Chicago, 1970, AMA. 75 p. Price: $1.50.

Handbook of Legal Medicine: By Alan R. Moritz and R. Crawford Morris. 3rd ed. St. Louis, 1970, Mosby. 238 p. Price: $8.75.

Healthful School Environment: Edited by Charles C. Wilson and Elizabeth Avery Wilson. Washington, D.C., 1969, NEA-AMA. 296 p. Price: $6.00.

Histology: By Thomas S. Leeson and C. Roland Leeson. 2nd ed. Philadelphia, 1970, Saunders. 525 p. Price: $11.00.

Infectious Agents and Host Reactions: Edited by Stuart Mudd. Philadelphia, 1970, Saunders. 626 p. Price: $22.50.

Pediatric Surgery: Edited by Clifford D. Benson and others. 2nd ed. Chicago, 1969, Yearbook of Medicine. 2 vols. Price: $50.00.

Practical Haematology: By John Vivian Dacie and S. M. Lewis. 4th ed. New York, 1968, Grune. 568 p. Price: $8.75.

Psychedelics: By Bernard Aaronson and Humphry Osmond. Garden City, New York, 1970, Doubleday. 512 p. Price: $2.45.

Psychiatry and The Criminal; A Guide to Psychiatric Examinations for The Criminal Courts: By John M. MacDonald. 2nd ed. Springfield, Ill., 1969, Thomas, 352 p. Price: $14.75. Gift.

So Human An Animal: By Rene Dubos. New York, 1968, Scribner. 267 p. Price: $2.45.

Systems of Ophthalmology, v. 10: By Duke-Elder. St. Louis, 1967, Mosby. 878 p. Price: $49.50.

Systems of Orthopaedics and Fractures: By A. Apley. 3rd ed. New York. 1968, Appleton. 524 p. Price: $22.50.

Textbook of Pathology: By William Boyd. 8th ed. Philadelphia, 1970, Lea & Febiger. 1464 p. Price: $20.00.

Textbook of Pediatrics: Edited by Waldo E. Nelson and others. 9th ed. Philadelphia, 1969, Saunders. 1589 p. Price: $21.50.

Textbook of Vectorcardiography: By Richard J. Kennedy and others. New York, 1970, Harper. 401 p. Price: $17.50.

Treatment of Burns: By Curtis P. Artz and John A. Moncrief. 2nd ed. Philadelphia, 1969, Saunders. 393 p. Price: $14.50.

Ulcerative Colitis: By J. C. Golighter and others. Baltimore, 1968, Williams & Wilkins. 365 p. Price: $16.75.

Water and Electrolyte Metabolism and Acid-Base Balance: By Edward Muntwyler. St. Louis, 1968, Mosby. 169 p. Price: $5.85.

Wine and The Digestive System: By Salvatore Lucia. San Francisco, 1970, Fortune House. 163 p. Price: Gift.

Book Reviews

Preparation for Childbirth: by Donna and Rodger Ewy. Pruett Publishing Company, Boulder, Colorado. Price: $3.50.

During the last twenty-five years there has existed a protest movement against the traditional medically oriented obstetrical care of the previous quarter century. The latter obstetrical care, dominated by specialists, emphasized prenatal care, improved management of labor and delivery with emphasis on early detection of complications, and their proper management. Home deliveries gave way to hospital deliveries and for proper medical reasons the patient was taken largely away from contact with her friends and family. The hospital substitute proved often impersonal and the answer to the patient's anxiety and pain aggravated by fear, was sedation, tranquilizers, and anesthesia. The protests mounted slowly but persistently. Natural childbirth, education, hypnosis, group therapy and exercises for the patients, and re-orientation toward the family with planned involvement of the husband in the labor and delivery room began to have proponents. One of these methods owes its origins to the work and philosophy of a French physician; and Donna and Rodger Ewy have subtitled their booklet on Preparation for Childbirth, "A Lamaze Guide." The authors were introduced to the Lamaze method in France. It advocates education in relaxation and proper breathing. Mrs. Ewy has had four children utilizing this method. The book ably portrays in a concise manner pelvic anatomy and the physiologic stages of labor. The authors describe the neuromuscular control exercises, ably illustrated so that the reader should have little difficulty in performing them after reading the text. Similarly the breathing technics are covered. Then labor is reviewed showing how the relaxation and breathing exercises are used. In summary a well prepared handbook of the Lamaze method.

The authors, obviously enthusiastic about this method, are also realistic, and realize that obstetric complications or situations can occur where methods other than "childbirth without pain" must be utilized. One quote perhaps gives some insight into the psychology of the Lamaze method. "The effectiveness of the Lamaze technic is due in large part to the distracting elements outside the contraction." The reviewer cautions about acceptance of one bit of advice in the text. "Don't let your husband talk you into going to the hospital too early in the game." To this I would substitute "let your doctor decide this issue; he feels more comfortable playing the game on his own court—the hospital delivery room."

For the expectant mother interested in more personal participation in the birth of her child this book offers information on the Lamaze method. For instructions, however, the prospective obstetrical patient and her husband should attend classes if such are available. In group therapy there is strength—as adequately proved by Alcoholics Anonymous and Weight Watchers.

Warren W. Tucker, MD
Denver

Issues and Trends in Medical Care: A new publication recording a series of discussions held in 1969 at the University of Utah concerning eight of the most critical issues now facing the health care field. Discussions were conducted as part of a Colloquium Series sponsored by the Intermountain Regional Medical Program, and featured Anne R. Somers, Hans O. Mauksch, Dwight L. Wilbur, James G. Haughton, and Robert R. Huntley.

Among the topics are: "The Poor and Health Care", "Medical Care Costs", "Health Manpower Needs", and "The Automation of Medical Care Delivery". The publication provides a stimulus for facing the current problems of the medical care system and will be of interest to "provider" and "consumer" alike. Two dollars per copy.

Copies of this publication may be obtained from: Communications Division, Intermountain Regional Medical Program, 50 North Medical Drive, Salt Lake City, Utah 84112.

"A Bibliography of Sports Medicine," compiled by the Academy's Committee on Sports Medicine, has been published by the American Academy of Orthopaedic Surgeons, Chicago, Illinois.

It is available at $2.00 per copy with quantity discounts. Write Publications Committee, American Academy of Orthopaedic Surgeons, 430 North Michigan Avenue, Chicago, Illinois 60611.

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Montana Medical Association

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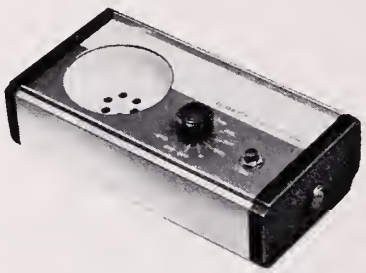

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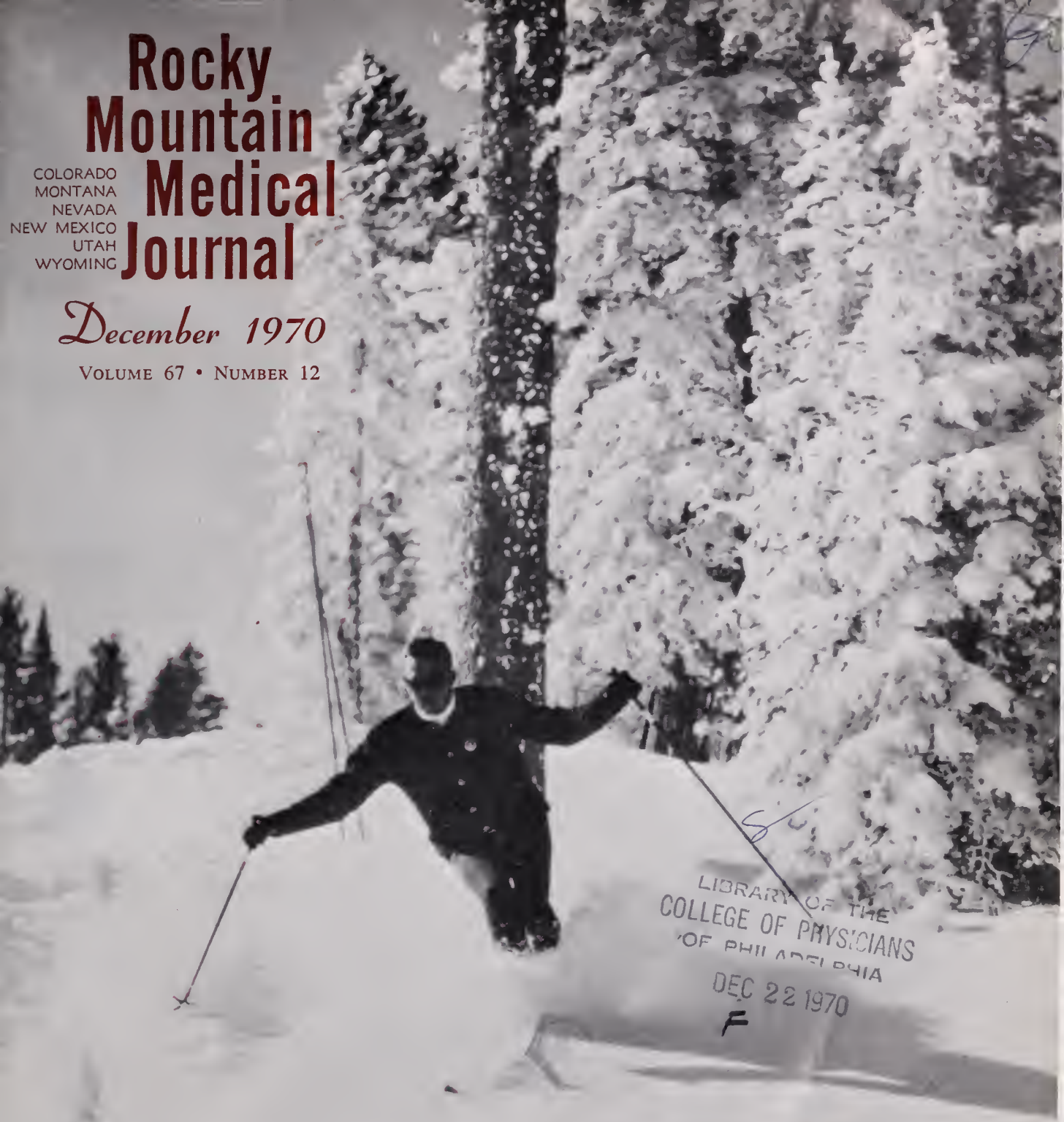

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(1) Siver, R. H.: CMD, 21:109, September 1954. (2) Frykman, H. H.: Minn. Med., 38:19-27, January 1955. (3) McGivney, J.: Tex. State Jour. Med., 51:16-18, January 1955. (4) Quehl, T. M.: Jour. of Florida Acad. Gen. Prac., 15:15-16, October 1965. (5) Weekes, D. J.: NY State Jour. Med., 58:2672-2673, August 1958. (6) Ellis, S. and Spratt, J. S.: JOUR. AMER. GER. SOC., 18:410-415, May 1970.

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University of Colorado School of Medicine
Postgraduate Medical Education

Colorado Academy of General Practice Annual Symposium
January 17, 1971

General Practice Review
January 18-23, 1971
February 1-6, 1971 (repeat of Jan. session)
June 21-26, 1971 (repeat of Jan. session)

High Risk Infant Care
February 8-12, 1971
October 4-8, 1971

Surgery of the Hand
February 16-19, 1971

Management and Care of Respiratory Insufficiency
April 14-16, 1971

Dermatology in General Practice
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Colorado Diabetes Association
Aspen Institute, Aspen, Colorado

March 18-22, 1971

Contact the office of the Colorado Diabetes Association, 1375 Delaware Street, Denver, Colorado 80204.

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San Diego, California

January 7-9, 1971

For more information write: Roald N. Grant, M.D., Vice President for Professional Education American Cancer Society, 219 East 42nd Street, N.Y., N.Y. 10017.

Third Annual Cerebral Function Symposium
Hemispherectomy and Cerebral Function
San Diego Bay, California

January 26-28, 1971

Direct all inquiries to : Dr. Lynn Smith, Chairman, Suite 1120, 2045 Franklin St., Denver, Colo. 80205.

Registration: $50.00.

23rd Annual Program of the
American Academy of Forensic Sciences
Del Webb's Towne House
Phoenix, Arizona

February 21-26, 1971

Write to Robert J. Joling, Esq., Program Chairman, 612 Kenosha National Bank Bldg., Kenosha, Wisconsin or to H. L. Kimball, Public Relations, 750 Main St. (Suite 1000), Hartford, Conn.

Society for Cryosurgery
Diplomat Hotel & Country Club
Hollywood, Florida

March 1-6, 1971

For further information write: Mary Trueblood, Secretary, Society for Cryosurgery, 30 N. Michigan Ave., Chicago, Illinois 60602.

MEDICAL SCHOOL NOTES

University of New Mexico School of Medicine

The increasing incidence of trauma and the medical importance of musculoskeletal diseases has led to the establishment of the Department of Orthopaedics at the University of New Mexico School of Medicine. The new department will be based at Bernalillo County Medical Center and the chairman will be George E. Omer, Jr., MD. Dr. Omer is internationally known for his special interest in hand surgery, and will also head a new Division of Hand Surgery in the Department of Surgery.

The new Department of Orthopaedics will be in close liaison with the Carrie Tingley Hospital for Crippled Children in Truth or Consequences. The new Department also will be active in the Albuquerque Veterans Administration Hospital where the chief of orthopaedics is Lewis Overton, MD. For many years Dr. Overton headed the Department of Orthopaedic Surgery at Lovelace Clinic and now is an associate professor of orthopaedics with the University of New Mexico School of Medicine. The establishment of the Department of Orthopaedics will be a focal point for teaching and distribution of information concerning musculoskeletal injuries, diseases, and activities in this special medical field.

* * * * *

Planning is underway at University of New Mexico School of Medicine which will speed the day when mesons from the $55 million Los Alamos facility can be used for medical treatment, probably leading to a dramatic advance in the treatment of cancer by radiation. An $83,693 planning grant from the Department of Health, Education and Welfare is being used by the medical school to involve as many resources in New Mexico as possible, checking with physicians and other "users" to get ideas while the medical portion of the meson facility is still in the planning stage.

The accelerator is to be completed in 1972 and it will be a significant period of time after that before patients can be treated. The UNM planning will center around: 1) pre-clinical work, using research animals, tissue culture cells, et cetera, and 2) logistic planning for the treatment of patients with tumors.

Dr. Robert Stone, dean of the medical school, is planning director. Working on the initial planning is Dr. Robert E. Anderson, from the Department of Pathology, Dr. Charles Key, assistant professor of pathology and head of the cancer division of the New Mexico Regional Medical Program, and Dr. Jon Shoop, chief of the medical school's Division of Nuclear Medicine. Working with the medical school on the early plans are members of the New Mexico Medical Society. Dr. Henry Ellis of Santa Fe, state president, has appointed a liaison committee to keep the state medical membership informed. Committee members include Drs. Herschel Douglas of Lovington, Robert Grier and Michael Stewart of Los Alamos, Andrew Kalivoda of Espanola, Earl Malone of Roswell, Rupert Pate of Carlsbad, medical student Timothy Carte, and four doctors from the medical school: Dr. Anderson, Dr. Key, Dr. Shoop, and Dr. James Gay who is committee chairman.

Only three other meson facilities exist in the world, none of which have been completed. These are located in British Columbia, Switzerland and Russia. The New Mexico facility will be ten times as powerful as any of the others. The nuclear particles will be able to reach a tumor deep in the body and destroy it without harming nearby, healthy tissue. Some other forms of radiation don't offer this advantage.

The medical school should eventually handle the actual management of the patient load, including the selection and scheduling of patients.

University of Utah Medical Center

A delicate new brain operation which involves the use of a microscope and miniature surgical instruments has been successfully performed at the University of Utah Medical Center, giving new hope to patients showing warning symptoms of stroke. O. Howard Reichman, MD, Salt Lake City neurosurgeon and assistant clinical professor of surgery at the University College of Medicine, grafted a small thread-like artery from the exterior of a patient's skull to the inner part of his brain, by-passing an obstruction in a major artery and bringing in a vital new blood supply.

Dr. Reichman first learned about the operation in 1967 from M. G. Yasargil, MD, well-known neurosurgeon from the University of Aurich, Switzerland. Since then, the Salt Lake doctor has experimented on laboratory animals to perfect his technic. Earlier this year he flew to Zurich to consult with Dr. Yasargil and to observe the European brain surgeon perform the operation for the 16th time.

The patient was suffering from "transient ischemis," attacks, a series of minor strokes which inevitably lead to a major crippling one. He actually did have a stroke while in CVU intensive care, but doctors were able to administer blood-thinning drugs in time to avert any brain damage.

The operation involved making a four to five inch flap in the scalp just above the patient's right ear. Using a specially built 40 power microscope, the neurosurgeon isolated a small thread-like

superficial temporal artery in the temple, brought it through a hole in the skull and grafted it to the middle cerebral artery. Such surgical work is extremely delicate since this artery is only one millimeter in diameter, a little smaller than the lead of a pencil. The operation required the use of miniaturized instruments specially made in Germany. Monofilament nylon suture material as thin as a cobweb was used to stitch the graft to the artery.

Dr. Reichman employed a binocular microscope, with a separate eyepiece for the assisting surgeon. The temporal artery which brought the new blood supply to the patient's brain is one of many in the temple region, and its removal from that area caused no blood deficit. The grafted artery by-passed the obstruction and brought the blood supply "in by the back door."

University of Nevada School of Medical Sciences

Television is being used to bring students and faculty at the University of Nevada, Reno, and practitioners and patients at Washoe Medical Center closer together for health sciences education. Equipment installed at the hospital and at the Anatomy building at the University permits transmission and reception of sound and picture in either direction. The first telecast in the three-month experimental program was made from the hospital to a class at the University this month. The project is funded by the federal Regional Medical Program and the University. It is a possibility that other hospitals in the Reno area will be linked to the system later.

The purpose of the intertie is for both the preparation of medical and health sciences students by bringing the clinical setting into the lecture hall, and also for the continuing education for practitioners by bringing the lecturer and the classroom to the professional where he works. Participants and observers are able to talk back and forth, in addition to the audio and visual telecast. The intertie supplements the traditional amphitheater in which students observe medical practitioners. This makes it easier for more students to see and to see better through picture enlargement and the use of multiple projectors in the classroom.

Another value of the system is the opportunity for self-evaluation of instruction, especially through the playback of taped and filmed telecasts.

The pilot project will consist of live and taped telecasts between the University and the Center on Thursday and Friday of each week. The Thursday sessions, covering the neurological conferences, will be an hour and a quarter long.

Friday telecasts, to be held in the afternoon, will include live presentations to pre-medical students covering basic neuroanatomy and physiology.

THE BOOK CORNER

New books received are acknowledged in this section and such acknowledgment must be regarded as sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits. Books are listed with advance data supplied by publishers. Prices quoted are not guaranteed. For further information, address queries to the publishers. Books here listed are available for lending from the Denver Medical Society Library.

Recent Acquisitions

Advances in Cancer Research, v. 13, 1970: Edited by George Klein. New York, 1970, Academic Press. 440 p. Price: $22.00.

Advances in Internal Medicine, v. 16, 1970: Edited by Gene H. Stollerman and others. Chicago, 1970, Yearbook of Medicine. 478 p. Price: $16.00.

Advances in Metabolic Disorders, v. 4, 1970: Edited by R. Levine and R. Luft. New York, 1970, Academic Press. 363 p. Price: $18.00.

Breathing: Hering-Breuer Centenary Symposium: By Ciba Foundation. London, 1970, Churchill. 402 p. Price: Gift.

Clinical Virology; The Evaluation and Management of Human Viral Infections: Edited by Robert Debre and Josette Celers. Philadelphia, 1970, Saunders. 871 p. Price: $38.00.

Control Processes in Multicellular Organisms: By Ciba Foundation. London, 1970, Churchill. 424 p. Price: $14.50.

Diagnosis and Treatment of Menstrual Disorders and Sterility: By Spencer L. Israel. 5th ed. New York, 1967, Hoeber. 638 p. Price: $25.00.

Diseases of The Liver: By Leon Schiff. 3rd ed. Philadelphia, 1969, Lippincott. 1102 p. Price: $39.50.

Fabricated Man, The Ethics of Genetic Control: By Paul Ramsey. New Haven, 1970, Yale University Press. 174 p. Price: $1.95.

Family Therapy in Transition, v. 7 (International Psychiatry Clinics): Edited by Nathan W. Ackerman. Boston, 1970, Little, Brown. 346 p. Price: Gift.

Frozen Cell: By Ciba Foundation. London, 1970, Churchill. 316 p. Price: $12.55.

Genetic Disorders of Man: Edited by Richard Goodman. Boston, 1970, Little, Brown. 1009 p. Price: $38.50.

Mysterium Coniunctionis, v. 14 (Collected Works): By Carl Gustave Jung. Princeton, N.J., 1970, Princeton University Press. 702 p. Price: $12.50.

Neurology in Pediatrics: By Patrick Bray. Chicago, 1969, Yearbook of Medicine. 514 p. Price: $23.50.

Orthopedic Diseases, Physiology, Pathology and Radiology: By Ernest Aegerter and John A. Kirkpatrick, Jr. Philadelphia, 1968, Saunders. 906 p. Price: $23.00.

Pathology of The Lung: By H. Spencer. 2nd ed. New York, 1968, Pergmon Press. 1106 p. Price $38.00.

Progesterone; Its Regulatory effect on The Myometrium: By Ciba Foundation. London, 1970, Churchill. 193 p. Price: $7.00.

Principles of Surgery: By Seymour I. Schwartz. New York, 1969, McGraw. 1805 p. Price: $24.50.

Progress in Allergy: v. 13, 1969: Edited by P. Kallos. New York, 1969, Karger. 429 p. Price: $21.60.

Proteins in Normal and Pathological Urine: Edited by Y. Manuel and others. Baltimore, 1970, University Park Press. 355 p. Price: $21.00.

Rypin's Medical Licensure Examinations, Topical Summaries and Questions: Edited by Arthur W. Wright. 11th ed. Philadelphia, 1970, Lippincott. 825 p. Price: $16.50.

Sturgis Standard Code of Parliamentary Procedure: By Alice Sturgis. 2nd ed. New York, 1966, McGraw. 283 p. Price: $4.50.

System of Ophthalmology; Physiology of The Eye and The Vision, v. 4, 1968: By Duke-Elder. St. Louis, 1968, Mosby. 734 p. Price: $46.50.

Thrombosis: By National Research Council. Washington, D.C. 1969, National Academy of Sciences. 762 p. Price: $12.50.

Treatment of Injuries to Athletes: By Don O'Donoghue. 2nd ed. Philadelphia, 1970, Saunders. 715 p. Price: $22:00.

Trigeminal Neuralgia, Pathogenesis and Pathophysiology: Edited by Rolf Hassler and A. Earl Walker. Philadelphia, 1970, Saunders. 196 p. Price: $29.00.

Atlas of Nuclear Medicine; Lung and Heart, v. 2: By Frank H. DeLand and Henry N. Wagner. Philadelphia, 1970, Saunders. 284 p. Price: Not set.

Autonomic Nervous System: By Joseph Pick. Philadelphia, 1970, Lippincott. 483 p. Price: $50.00.

The Biliary Tract: By Gerald S. Dowdy. Philadelphia, 1969, Lea & Febiger. 316 p. Price: $18.00.

Cardiovascular Pathology, v. 3: By Reginald B. Hudson. Baltimore, 1970, Williams & Wilkins. 1166 p. Price: $30.00.

Chemotherapy of Cancer: Edited by Warren H. Cole. Philadelphia, 1970, Lea & Febiger. 349 p. Price: $12.50.

Clinical Gastroenterology: By Howard M. Spiro. New York, 1970, MacMillan. 1011 p. Price: $35.00.

Congenital Heart Disease, v. 2 #1 (Cardiovascular Clinic): Edited by Albert N. Brest. Philadelphia, 1970, Davis. 330 p. Price: $7.50

Current Dermatologic Management: Edited by Stuart Maddin. St. Louis, 1970, Mosby. 330 p. Price: $38.75.

Current Psychiatric Therapies, v. 10: Edited by Jules H. Masserman. New York, 1970, Grune & Stratton. 239 p. Price: $14.75.

Handbook of Medical Treatment: By Milton J. Chatton. 12th ed. Los Altos, California, 1970, Lange. 789 p. Price: $6.50.

Laparoscopy, Culdoscopy and Gynecography; Technique and Atlas, v. 1 (Major Problems in Obstetrics & Gynecology): By Melvin R. Cohen. Philadelphia, 1970, Saunders. 171 p. Price: $11.00.

Medical Mycology: By Chester W. Emmons and others. 2nd ed. Philadelphia, 1970, Lea & Febiger. 508 p. Price: $14.85.

Obesity and Its Management: By Denis Craddock. Edinburgh, 1969, Livingstone. 191 p. Price: $8.25.

Ocular Syndromes: By Walter J. Geeraets. 2nd ed. Philadelphia, 1969, Lea & Febiger. 289 p. Price: $9.00.

Operative Gynecology: By Richard W. Te Linde and Robert F. Mattingly. 4th ed. Philadelphia, 1970, Lippincott. 874 p. Price: $35.00.

Photographic Atlas of Reconstructive Arterial Surgery: By Reinier J.A.M. Van Dongen. New York, 1970, Springer-Verlag. 357 p. Price: $37.50.

Primary Tuberculosis in Childhood: By Jacques Gerbeaux. Springfield, Ill., 1970 Thomas, 339 p. Price: Review:

Progress in Liver Diseases, v. 3: Edited by Hans Popper and Fenton Schaffner. New York, 1970, Grune & Stratton. 562 p. Price: Not set.

Skin Signs of Systemic Disease: By Irwin M. Braverman. Philadelphia, 1970, Saunders. 448 p. Price: $31.00.

So You're Going to Have Surgery: By James Graham. New York, 1970, Hawthorne. 280 p. Price: $6.95.

Surgical Pathology: By Lauren V. Ackerman. 4th ed. St. Louis, 1968, Mosby. 1140 p. Price: $29.75.

Book Reviews

The newly published second edition of the **Current Procedural Terminology (CPT)** is now offered to physicians as an aid in settling claims for compensation through insurance companies or Medicare and Medicaid. It is a uniform system of terminology and coding which provides a method to describe diagnostic or therapeutic procedure.

The concepts of the book have been implemented through studies made by the AMA Committee on Health Care Financing. The format of this second edition is similar to the first in its alphabetical and numerical listing of procedures and the use of special headings and sections.

CPT is priced at $2, less 50 per cent discount on medical society orders; from American Medical Association, 535 North Dearborn Street, Chicago, Ill. 60610. Checks must accompany orders.

* * * * *

Guides to the Evaluation of Permanent Impairment—The Hematopoietic System. The thirteenth guide in the series, "Guides to the Evaluation of Permanent Impairment" developed by the Committee on Rating of Mental and Physical Impairment is now available.

This guide, like all the others in the series, has been designed primarily for use by physicians. The guide is, however, of interest and use to all concerned with the medical, administrative, or judicial aspects of programs for the disabled. The previously published guides in the series deal with the extremities and back; the visual system; the cardiovascular system; ear, nose, throat, and related structures; the central nervous system; the digestive system; the peripheral spinal nerves; the respiratory system; the endocrine system; mental illness; the reproductive and urinary systems; and the skin.

A limited number of copies of this guide may be obtained, without charge, upon written request to the Committee on Rating of Mental and Physical Impairment, 535 North Dearborn Street, Chicago, Illinois 60610.

* * * * *

Medical Virology: by Frank Fenner and David O. White, Academic Press, New York. 401 pages. Price: $9.50.

A new look at viruses has become necessary because the pattern of viral diseases has changed drastically over the past several decades. Although vaccination and other preventive measures have all but eliminated viral diseases such as polio and measles, jet-age travel and the population explosion in urban areas have increased the spread of others such as viral hepatitis and respiratory diseases caused by viruses. Furthermore, viral research promises to assume new importance in the decades to come.

Medical news suggests the possibility that viruses may cause cancer in humans, and this development is being explored on many fronts.

In order to understand and use antiviral drugs when practical procedures for manufacturing them are developed, doctors need to understand the molecular biology of viral replication. **Medical Virology** will be of great value not only to practicing physicians and medical students, but also to university teachers, graduate and undergraduate students in the life sciences, and students of veterinary medicine. It gives today's doctors and medical students the background for tomorrow's treatment of viral diseases.

Part I summarizes the principles of animal virology in relation to human infection and disease. Part II illustrates these principles with an account of the viral diseases that affect man. The book considers the problems involved at the levels of both the individual patient and public health management. It contains many illustrations and diagrams which facilitate clearer understanding of human viruses and viral diseases.

OBITUARIES

Utah

Olof Sundwall, MD, retired Murray physician, died October 30, 1970, at the age of 79. The son of Peter Olofson and Anna Johannesson Sundwall, he was born June 14, 1891, in Fairview, Sanpete County, Utah. He was married to Martha Nyvall on October 17, 1919, in Farmington; she died February 13, 1958. He married Louise Critchlow on October 12, 1958.

A 1918 graduate of the Washington University Medical School, St. Louis, Doctor Sundwall completed an internship at the St. Mark's Hospital in Salt Lake City. He practiced medicine in Mt. Pleasant from 1920-26, and in Murray from 1926-62. He served on the staffs of the St. Mark's Hospital and Cottonwood Maternity Hospital, and was affiliated with the Salt Lake County, Utah State, and American Medical Associations.

Doctor Sundwall is survived by his widow; a daughter, Mrs. Melvin (Clare) Davis, Salt Lake City; a son, Kenneth W., Richardson, Texas; a granddaughter; and a sister, Mrs. Alma (Mary) Brockbank, Salt Lake City.

* * * * *

Samuel W. Georges, MD, Provo physician and surgeon, died November 7, 1970. He was 68. Born July 4, 1902 in Urumia, Iran, he was the son of Warda and Leah Arsanis Georges. He married Elizabeth Larson in Storm Lake, Iowa, January 31, 1929.

Doctor Georges received his M.D. degree in 1931 from Creighton University, later completing an internship at L.D.S. Hospital in Salt Lake City. He also did postgraduate work at several other institutions, including the Mayo Clinic. A former president of the Utah County Medical Society, Doctor Georges had practiced in the Utah County area for 35 years. During this time he served for ten years as a physician in Spanish Fork, also maintaining his own hospital there. He was on the surgical staff of Utah Valley Hospital, and had also served as Chief of Staff. In addition to his membership in the Utah State and American Medical Associations, he was affiliated with the World Medical Association and the American Association of General Practitioners. For five years he was a member of the Selective Service Board, and had also served for 15 years in the Army Medical Reserve.

Survivors include his widow; one son and two daughters, Ramon Warda, and Mrs. Ralph (Sherine) Stephens, both of Salt Lake City, and Mrs. Thomas (Valene) Goldenberg, Buenos Aires, Argentina; and also five grandchildren.

Wyoming

Reuben J. (Jake) Boesel, MD, of Cheyenne, died on August 8, 1970. He was well known over the Rocky Mountain region and a highly respected surgeon.

Doctor Boesel was born April 22, 1895, in New Bremen, Ohio, and later attended Ohio State, graduating from the medical school there in 1921. He subsequently took postgraduate training and entered private practice, returned to a fellowship of surgery at the Mayo Clinic in 1927 during which time he was a first assistant to Dr. Charles Mayo.

In 1930, Doctor Boesel married Marian Allen and, in 1931, began his practice in Cheyenne where he resided until the time of his death. Doctor Boesel had been the Chief of Staff and Surgery at both DePaul and Memorial Hospitals here, served two terms on the Board of Governors in the American College of Surgeons and was a member of the Southwestern Surgical Society, the AMA, and the Mayo Clinic Alumni Association.

Doctor Boesel was the medical consultant for the State of Wyoming for the Rehabilitation and Old Age and Survivors Programs for more than 25 years—the longest tenure of service in this country.

Doctor Boesel is survived by his wife, Marian, and two daughters, Mrs. W. O. Sills of Cheyenne and Mrs. R. L. Owens of Denver and seven grandchildren.

Colorado

James R. Bramley, MD, born in Jordan, New York, March 27, 1885, died November 6, 1970. He was 85.

Doctor Bramley was educated in the Jordan public schools. During vacations he worked on the day line of the Hudson River boats running from Albany to New York City in order to attend New York Homeopathic Medical College from which he received his MD in 1910.

After an internship at Metropolitan Hospital and at Hahnemann Hospital in New York, Doctor Bramley practiced medicine first in Arlington, New Jersey, for two years, then in Summit, New Jersey, for three years. In 1916 he moved to Denver where he practiced medicine for over 50 years.

Doctor Bramley was past president of Presbyterian Medical Center, and on the staff of Denver Children's Hospital. He was a member of the Colorado Medical Society, the Denver Medical Society, the American Medical Association and the American Institute of Homeopathy, and he was a secretary of the Colorado State Homeopathic Society.

He is survived by a son Howard F., Denver; a daughter, Mrs. John W. Bricker, Denver; 10 grandchildren and two great-grandchildren.

Roche announces

Efudex®

(fluorouracil) cream/solution

for the treatment of solar/actinic keratoses... a topical alternative to conventional therapy

1/22/68—Treatment with 5% 5-FU cream commences. Patient K.L. showing widespread but mild solar keratoses (also known as actinic keratoses).

Fluorouracil—the Roche contribution

In 1962, Roche Laboratories introduced Fluorouracil Roche® (5-fluorouracil). Early clinical work with this drug suggested that it possessed a selective cytotoxic activity when applied topically to certain kinds of lesions. Based on this work and years of clinical trials, a standardized form of topical fluorouracil can now be recommended for treatment of multiple solar or actinic keratoses.

Efudex®(fluorouracil)—a new alternative to conventional therapy

Efudex presents the physician with a topical alternative to surgery in the treatment of solar or actinic keratoses. It is effective, comparatively inexpensive and especially well-suited for treatment of multiple lesions. Important, too, is the highly desirable cosmetic result. Clinical experience demonstrates that treatment with Efudex results in an extremely low incidence of scarring.*

Highly effective on first and later applications

In clinical trials, depending on the dosage form and strength used, complete involution occurred in 77 to 88 per cent of lesions following treatment. The rate of recurrence was low, ranging from 1.7 to 5.6 per cent up to a year after completion of therapy. When lesions did recur or new ones appeared, repeated courses of Efudex therapy proved effective.*

2/2/68—After 11 days of treatment. Erythema is seen at site of keratoses. In addition, numerous lesions not apparent prior to therapy have become manifest by sharply defined reactions. Intervening skin, also treated, shows no response to therapy.

2/19/69—One year after cessation of therapy. Skin appears clear with no evidence of scarring. Examination reveals lack of recurrence or the formation of new lesions.

Predictable sequence of therapeutic response

Two to four weeks constitutes a typical course of Efudex therapy. The response is usually characteristic and predictable. After three or four days of treatment, erythema begins to appear in the area of the keratoses. This is followed by an intense inflammatory response, scaling and occasionally moderate tenderness or pain. The height of the inflammatory reaction generally occurs two weeks after the start of therapy, and then begins to subside as treatment is stopped. Within two weeks of discontinuing medication, the inflammation is usually gone. A mild erythema may remain for two to three months before gradually receding.

Selective—with a high degree of safety

Despite the temporary unsightliness and discomfort of the inflammatory episode, Efudex is, in general, more readily tolerated than surgery. Clinical work shows the intense inflammatory response to be limited to the area of the lesion. Normal skin is not similarly affected. Another measure of Efudex safety: systemic absorption of topical fluorouracil was insignificant, indicating a low risk of systemic toxicity.*

Two strengths—two convenient dosage forms

Efudex is available as a 2% or 5% solution or as a 5% cream. It is applied twice daily by the patient with a nonmetal applicator or suitable glove.

Before prescribing Efudex, however, there are two important considerations. First, please consult the complete prescribing information for precautions, warnings and adverse reactions. Second, advise the patient that treated lesions should respond with the characteristic but transient inflammation. A positive sign that Efudex is working for them.

*Data on file, Hoffmann-La Roche Inc., Nutley, New Jersey.

2% and 5% Solutions; 5% Cream Applied twice daily—resolves solar or actinic keratoses.

new Efudex® (fluorouracil) cream/solution

For full prescribing information, please see the following page.

Roche introduces

Efudex®

(fluorouracil) cream/solution the new standardized topical for solar/actinic keratoses

Description: Efudex solutions and cream are topical preparations containing the fluorinated pyrimidine 5-fluorouracil, an antineoplastic antimetabolite.

Efudex Solution consists of 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris-(hydroxymethyl) aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream contains 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

Actions: There is evidence that the metabolism of fluorouracil in the anabolic pathway blocks the methylation reaction of deoxyuridylic acid to thymidylic acid. In this fashion fluorouracil interferes with the synthesis of deoxyribonucleic acid (DNA) and to a lesser extent inhibits the formation of ribonucleic acid (RNA). Since DNA and RNA are essential for cell division and growth, the effect of fluorouracil may be to create a thymine deficiency which provokes unbalanced growth and death of the cell. The effects of DNA and RNA deprivation are most marked on those cells which grow more rapidly and which take up fluorouracil at a more rapid pace. The catabolic metabolism of fluorouracil results in degradative products (*e.g.*, CO_2, urea, α-fluoro-β-alanine) which are inactive.

Studies in man with topical application of ^{14}C-labeled Efudex demonstrated insignificant absorption as measured by ^{14}C content of plasma, urine and respiratory CO_2.

Indications: Efudex is recommended for the topical treatment of multiple actinic or solar keratoses.

Contraindications: Efudex is contraindicated in patients with known hypersensitivity to any of its components.

Warnings: If an occlusive dressing is used, there may be an increase in the incidence of inflammatory reactions in the adjacent normal skin.

Prolonged exposure to ultraviolet rays should be avoided while under treatment with Efudex because the intensity of the reaction may be increased.

Usage in Pregnancy: Safety for use in pregnancy has not been established.

Precautions: If Efudex is applied with the fingers, the hands should be washed immediately afterward. Efudex should be applied with care near the eyes, nose and mouth. To rule out the presence of a frank neoplasm, a biopsy should be made of those areas failing to respond to treatment or recurring after treatment.

Adverse Reactions: The most frequently encountered local reactions were pain, pruritus, hyperpigmentation and burning at the site of application. Other local reactions included dermatitis, scarring, soreness and tenderness.

Also reported were insomnia, stomatitis, suppuration, scaling, swelling, irritability, medicinal taste, photosensitivity and lacrimation.

Laboratory abnormalities reported were leukocytosis, thrombocytopenia, toxic granulation and eosinophilia.

Dosage and Administration: Efudex should be applied twice daily with a nonmetal applicator or suitable glove in an amount of the solution or cream sufficient to cover the lesion. When Efudex is applied to a lesion, a response occurs with the following sequence: erythema, usually followed by vesiculation, erosion, ulceration, necrosis and epithelization. The lower frequency and intensity of activity in adjacent normal skin indicate a selective cytotoxic property. Medication should be continued until the inflammatory reaction reaches the erosion, necrosis and ulceration stage, at which time use of the drug should be terminated. The usual duration of therapy is from 2 to 4 weeks. Complete healing of the lesion may not be evident for 1 to 2 months following cessation of Efudex therapy.

How Supplied: Efudex Solution, 10-ml drop dispensers—containing 2% or 5% fluorouracil on a weight/weight basis, compounded with propylene glycol, tris(hydroxymethyl)aminomethane, hydroxypropyl cellulose, parabens (methyl and propyl) and disodium edetate.

Efudex Cream, 25-Gm tubes—containing 5% fluorouracil in a vanishing cream base consisting of white petrolatum, stearyl alcohol, propylene glycol, polysorbate 60 and parabens (methyl and propyl).

Clinical Studies: The effectiveness of the three preparations as determined by complete involution of solar keratoses was: 2% Solution, 77% of 282 lesions; 5% Solution, 88% of 202 lesions; and 5% Cream, 85% of 189 lesions. In those lesions where complete involution followed treatment, the rate of possible recurrences observed clinically at periods up to 12 months or more was: 2% Solution, 4.6% of 218 lesions; 5% Solution, 1.7% of 177 lesions; and 5% Cream, 5.6% of 160 lesions. Because of the toxic potential of fluorouracil, some physicians preferred to use the 2% solution when large areas were to be treated. Approximately 30% of the lesions required treatment for two weeks or less; approximately 78% required four weeks or less for adequate treatment.

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Picture of a sprained shoulder

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Paraflex® (chlorzoxazone)* 250 mg.
Tylenol® (acetaminophen) 300 mg.

Parafon Forte tablets help to relieve pain, restore mobility . . . stop pain-spasm feedback by providing:

a nonsalicylate analgesic equal to aspirin for the relief of pain,[1,2] yet unlikely to produce the irritation to the gastric mucosa so often associated with salicylate therapy[2]

and a skeletal muscle relaxant effective in a wide variety of conditions[3-5]...but not likely to have the central effects of tranquilizing compounds.[5]

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WE CALL YOUR attention to "Chronic Granulomatous Disease of Childhood" and especially to the subtitle, "Hematogenous osteomyelitis due to non-pigmented Serratia marcescens" on page 17 of this issue of the *Journal*.

Serratia!

Serratia marcescens was first demonstrated by Bartolomeo Bizio in 1823 as the cause of "bleeding" pollution. This small gram-negative rod occurs almost everywhere, its habitat being air, soil and water. It produces a red pigment, but a characteristic feature of the species of Serratia is the variability of their pigmentation, and all degrees probably occur in all of its species, with the color of colonies ranging from bright red to white. In the laboratory, pigmentation is dependent upon composition of the media.

Serratia marcescens forms the red crust around the rim of the farmer's well. It is found on meat, potatoes and other foodstuffs. It is the bacteria that produces "bleeding bread," which has been used in the Church, not always to its glory. It was once used by beggars to produce "bleeding" factitious wounds. It has been employed in teaching in elementary bacteriology for generations under the impression that it was a harmless saprophyte, the beautiful red pigment facilitating easy recognition of its colonies. A colleague recalls his college bacteriology where a suspension of the organism was sprayed into the mouth for demonstration of the distance of dissemination by subsequent coughing.

BUT — as noted by Smith and Conant (*Zinnser Bacteriology*) in 1957, "Because of, or coincidentally with, the introduction of sulfonamides and antibiotics, Serratia marcescens is appearing as a pathogen for man. Pulmonary infections, septicemia and deaths have been reported. . . . Some strains are susceptible to the broad spectrum antibiotics, but rapidly acquire resistance." In 1962 there was the first report of spread of Serratia in epidemic form in a hospital, analogous to the spread of penicillin-resistant staphylococcus.[1] There continues to be increasing numbers of serious and fatal infections by this "harmless," ubiquitous saprophyte, and we note increasing incidence of complications by Serratia in our community. The seriousness of this infection in man is compounded by the limited number of antibiotics that are effective against it.

Recent emphasis on our ecology has made us aware of many frightening problems. None are more alarming than the production of new and deadly pathogens by changes in the environment of once harmless microorganisms by use of antibiotics. The little bug with the red pigment that was once used for tricks is not a joke anymore.

NOT ENOUGH physicians practice in the poor neighborhoods of our large urban cities. Yet the medical needs of the people in these areas are urgent—and they should and must be met. How can we do it? One way would be for the Federal Government to establish a special Medical Corps to serve these areas — *and to accept such service as a substitute for military duty.*

*Proposal: A Ghetto Medical Corps in lieu of Military Service**

This thought occurred to me when it was recently suggested that two proposed neighborhood health centers come under the wing of Harlem Hospital, at least to the extent that Harlem serve as the back-up hospital and possibly be responsible for the supervision of the care tendered and the recruitment of the professional staff. I have been

[1] Ewing, W. H., Johnson, J. C., and Davis, B. R.: Pub. Health Serv., CDC, Atlanta, Ga., 1962.

*Reprinted from February, 1970, *Resident and Staff Physician*. The author is Charles A. Ragan, Jr., MD, Lambert Professor of Medicine, Columbia University College of Physicians and Surgeons; Director, Medical Service, Harlem Hospital Center, N. Y. C.

asked to enlist staff for another center already in operation and one of my attending physicians has left to direct another. The two proposed centers have had their capital budgets approved, architectural drawings completed, equipment lists made up, and have every expectation of operational funds being approved. The planning has been by architects and public health officials who have little knowledge of:

The problems of professional and technical staffing.

The delivery of care, and of supplying supervision to assure the competence of that care.

There are relatively few physicians in the areas to be covered and most of them are already quite busy on the staff of this hospital or in their private practices. Recruitment of house staff for outpatient work as a major part of their training is in its infancy,[1] and it is doubtful if the large numbers required could be obtained and the necessary supervision given.

Thus the thought that one possible answer to the dilemma of professional recruitment—technician recruitment is another story, which I will not consider now—would be to establish this as a form of national service in lieu of military service. Well-trained people, either at the end of their training program or after internship and one year of residency—similar to the Berry plan rules—would provide the staff for these health centers. It would be possible to supervise these people and to develop a program which could be fully as stimulating and rewarding as the Indian Service, the CDC, and the now terminated control programs of the USPHS.

The need is great and the means are at least possible. It could be done.

[1] Kindig, D. A.: Social-medical House Officerships, Letter to Ed., NEJM 281:1078:11/6/69.

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ROCKY MOUNTAIN MEDICAL DIRECTORY of PHYSICIANS

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Chronic granulomatous disease of childhood

*Hematogenous osteomyelitis due to non-pigmented Serratia marcescens.**

J. Phillip Nelson, MD, Denver

It is the purpose of this report to present a case of chronic granulomatosis of childhood and to discuss this entity in general as well as the peculiar association of Serratia marcescens infection with this disease.

CASE REPORT

The patient was an eight-year-old Caucasian male at the time of admission to the U.S. Naval Hospital, Memphis, Tennessee. The present illness began five days prior to admission when he developed pain and swelling in the region of his left ankle. One day prior to admission, a low grade fever was noted and the ankle pain increased in severity.

The significant past medical history began at age nine months when the patient had pneumonia and cervical adenitis. He then experienced multiple recurrent episodes of impetigo. At age eighteen months, multiple liver abscesses due to staphylococcus aureus were surgically drained and his convalescence was stormy and prolonged. At age two years, an empirical diagnosis of rheumatoid arthritis was made and a course of corticosteroids was given. However, recurrent lung and skin infections continued and there were no joint manifestations of Still's disease. Subsequently, a diagnosis of hypogammaglobulinemia was made despite the lack of corroborating laboratory evidence. The patient was given periodic gamma globulin injections until age three years when the gamma globulin was stopped, apparently because of lack of a specific diagnosis. From age three to five years, multiple hospitalizations for investigation of persistent fever and furunculosis were required, but no specific diagnosis was established and from age five to seven years, the patient had at least twelve documented upper respiratory and lung infections due to staphylococcus. At age seven, hematogenous osteomyelitis of the left third metacarpal due to E. coli required surgical drainage. Following slow healing of this infection, the patient continued to have recurrent episodes of fever and pneumonia. During this period, numerous prolonged courses of multiple antibiotics were given. Numerous laboratory studies, including repeated serum protein electrophoretic and immunoglobulin determinations, had been within normal limits prior to the present admission.

*The opinions and assertions contained herein do not necessarily reflect the views of the Bureau of Medicine and Surgery of the Navy Department or the Naval Service at large.

The family history revealed no history of reduced resistance to infection in the patient's parents, three siblings, or more distant relatives.

The physical examination revealed a thin, almost emaciated, pale boy who appeared ill and complained of left ankle pain. Temperature was 102.2 degrees. A faint butterfly rash was present on the face. The teeth were stained brown (presumably from Tetracycline). The chest was clear to percussion and auscultation. Cardiomegaly and heart murmurs were not present. A right upper quadrant abdominal scar was noted and the spleen was palpable one centimeter below the costal margin. The liver was not palpable. Neither localized nor diffuse adenopathy was palpable. No neurological abnormalities were elicited. The left ankle was splinted in 20 degrees plantar flexion and attempted passive motion of the ankle produced severe pain. Diffuse tenderness associated with warmth and moderate swelling of the distal leg and ankle were present. A moderate effusion was palpable in the ankle.

Initial laboratory examinations revealed a hemoglobin of 11.6 gms.%, hematocrit of 33%, white blood count of 14,100 (61% segs, 34% lymphs, 2% eos, and 3% basos), sedimentation rate of 12, SGOT of 6, and negative latex fixation tests. Repeated blood cultures showed no growth. An electrocardiogram was interpreted as normal except for sinus tachycardia. Diffuse fibrotic stranding, but no acute process, was present on the chest x-ray. X-rays of both legs and ankles revealed no abnormalities except for soft tissue swelling about the left distal leg.

Shortly after admission, four centimeters of clear fluid was obtained by aspiration from the left ankle. Synovial fluid analysis revealed a few neutrophils and no organisms on gram stain. Subsequent synovial fluid cultures were negative for bacteria and fungi. Specific therapy was initially withheld because of failure to establish a definitive diagnosis. Repeated white blood counts, differential counts, sedimentation rates, blood cultures, and left ankle x-rays for bone detail remained within normal limits until five days following admission when the sedimentation rate was 28. The patient continued to run a nonremittent fever of 101 degrees and to exhibit signs in the left ankle region found at the time of admission. Six days following admission, probable fluctuance was first palpated over the distal left tibia and aspiration produced six centimeters of thick yellow pus. The patient was started on intravenous Procaine Penicillin (15,000,000 U. daily) and Prostaphlin (500 mgm. orally q3h). Incision of the medial distal left leg revealed a circumferential subperiosteal abscess of the tibial metaphysis. The bone was windowed and an intramedullary abscess cavity measuring one inch in length was curetted. Tubes for constant Neomycin (½ per cent) irrigation were instilled and the patient was started on IV Kanamycin (180 mgm. q8h). There was rapid defervescence and pain relief postoperatively.

Cultures were initially interpreted as showing aerobacter aerogenes, but subsequent examination revealed the organism to be non-pigmented Serratia marcescens. The organism was relatively resistant to all antibiotics tested, but was least resistant to Kanamycin, Tetracycline, Chloromycetin, and Gantrisin.

The patient was hospitalized essentially continuously during the succeeding year which was marked by failure to control the infection despite constant antibiotic coverage. Several metastatic subcutaneous abscesses developed on the left leg. Pathologic fracture of the distal tibia, extension of the infection into the distal tibial epiphysis, and distal subluxation of the fibula occurred. Following two trials of wound Neomycin irrigation for two weeks, the wounds were subsequently treated by the open or Orr technic. Approximately twenty dressing changes under anesthesia were necessary because of the extensive nature of the patient's wounds and his anxiety. Failure of the wounds to form granulation tissue or to epithelialize was remarkable during this period. Following forty-five days of continuous IV Kanamycin therapy, fear of producing auditory or kidney damage prompted cessation of the drug.

During the first year of hospitalization, Kanamycin was given in four discontinuous periods for a total of 139 days. During this time, weekly audiograms and biweekly BUN's and urinalyses remained normal. At the end of this period, an audiogram demonstrated minimal high frequency hearing loss. Varying periods utilizing acqueous Penicillin, Colymycin, Keflin, Chloromycetin, and Gantrisin were used to supplant the Kanamycin. During one period when Colymycin replaced Kanamycin, a metastatic focus of osteomyelitis in the right distal fibular epiphysis developed. Incision and drainage was necessary and the organism was non-pigmented Serratia marcescens. A killed vaccine was prepared from the culture by the University of Tennessee Immunology Laboratories and given by deep intramuscular injection for several weeks. Chloromycetin produced a prompt fall in the white blood count. Gantrisin, eight grams daily, was given orally during the latter stages of hospitalization. None of these preparations had appreciable effect on the infection.

Because of persistent anemia, transfusion was considered on several occasions. Routine cross-matching on over twenty-five consecutive different donor bloods (group A, Rh positive as was the patient) proved incompatible. Assistance from the Philip Levine Laboratory of the Ortho Research Laboratory was sought. His blood grouping was found to be A positive genotype R_2R_2 (DcE/DcE) and the direct Coombs test was negative. The patient's cells were tested against many other cells and antibodies and were found to be compatible with one other person's cells in the United States whose Kell grouping was k-k-w, k_p (a+b+w), Js (a—b+w). Transfusions were not possible, therefore. Ten months following admission, a sample

of the patient's blood was sent to Dr. Robert Baehner, Children's Hospital Medical Center, Boston, Massachusetts who performed the qualitative nitroblue tetrazolium test on the patient's white cells. The cells failed to reduce the dye in thirty minutes and the test confirmed the diagnosis of chronic granulomatous disease of childhood.

Approximately one year following admission, the wounds began to heal by secondary intention although cultures still remained positive for non-pigmented Serratia marcescens. Fourteen months following admission, cross union of the left distal tibia to the fibula had occurred and the wounds had healed sufficiently to allow removal of the casts and to begin whirlpool bath treatments to the patient's legs. Thereafter, the wounds healed rapidly and sixteen months following admission ambulation utilizing a left short leg patellar weight bearing brace was begun. Approximately eighteen months after the onset of the distal tibial osteomyelitis, all wounds were healed. During this entire period, intermittent episodes of skin eruptions and upper respiratory infections continued.

Discussion

Chronic granulomatous disease of childhood[1,2,3] is a recently recognized x-linked recessive syndrome effecting only males characterized clinically by recurrent infections, eczematoid and impetigo-like dermatitis, pulmonary infiltrates and bronchial lymphadenopathy, localized or generalized lymphadenopathy which may be suppurative and hepatosplenomegaly. These signs are usually present in the first year of life and are heralded by cervical lymphadenitis, mimicing scrofula, and the dermatitis which effects the periorbital nose and mouth areas. The clinical course is then marked by multiple recurrent infections of the lungs, liver, pericardium, and bones. Histological examination of tissue has revealed sterile, tuberculosis-like caseating granulomas in many organs and acute foci of inflammation which usually produce staphylococcus, aureus, an enterobacteriacae species (E. coli, aerobacter, salmonella, or Serratia) or a fungus when cultured. Except for staphylococcus, these organisms are distinctive because of their usually low virulence. All laboratory studies are normal except the hemoglobin is chronically low and the leukocyte count and sedimentation rate are high in response to clinical infection. Hypergammaglobulinemia is an inconstant finding.

The basic defect has been localized to the polymorphonuclear leukocyte where there is a failure of degranulation following phagocytosis of bacteria. This defect may also be present in monocytes and fixed histiocytes. In effected individuals, the bacteria are not killed after phagocytosis and this presumably applies to viruses also. Interestingly, more virulent bacteria such as streptococci are killed. A specific diagnostic test has been devised by Baehner[4] in which nitroblue tetrazolium is reduced by normal leukocytes, but is not reduced by leukocytes from affected children. Mothers of affected males may demonstrate a mixed population of normal and non-reducing leukocytes which is called the Lyon effect. It is postulated that the failure of degranulation represents a failure of liberation of lysozymes. The defect is apparently an enzyme deficiency in the energy production response of the leukocyte.

Pigmented or unpigmented Serratia marcescens are actively motile, non-sporulating, short gram negative rods which have recently been incriminated more frequently in significant clinical infections. The organisms are usually found in water, soil, and food contaminants and they have generally been regarded as harmless saprophytes.. They may be differentiated from other enterobacteriacae by relatively complex bacteriologic methods.[5] The first report of human infection due to this organism was that of Woodward and Clark in 1913.[6] Subsequently, sporadic reports of pulmonary or urinary infections[7,8] secondary to these organisms in patients with debilitating disease and as "super-infections" after intensive antibiotic therapy were reported. More recently, reports of septicemia due to these organisms have been reviewed by Altemeier, et al.[9] According to Magnuson and Elston,[5] the organisms are sensitive only to Kanamycin, Neomycin, and Chloramphenicol. Sensitivity testing is recommended for all isolated strains. Two recent reports[10,11] have documented three additional cases of Serratia marcescens osteomyelitis in children. Two of these children had chronic granulomatosis of childhood and it was considered a possible underlying condition in the third case.

In addition to the rare nature of the patient's primary disease, the clinical course was characterized by several other features worthy of comment. The initial infection did not respond to standard measures of osteomyelitis treatment consisting of drainage, sequestrectomy, tube irrigation, suction drainage, high doses of intravenous antibiotics over a prolonged period, and open treatment with cast immobilization (Orr treatment). Wounds failed to produce granulation tissue of good quality and no tendency toward epithelialization from the wound margins was seen for many months. Kanamycin was used at maximum recommended dosage parenterally for prolonged periods before evidence of ototoxity developed. The patient's very rare blood grouping has not been previously reported to be associated with chronic granulomatosis of childhood and may have been related to previous transfusions or peculiar to the patient.

Summary

A case of chronic granulomatosis of childhood complicated by hematogenous osteomyelitis due to non-pigmented Serratia marcescens has been presented. The basic disease process and infections due to Serratia species have been reviewed. Attention has been drawn to the failure of normal healing process, the marked tolerance of this patient to Kanamycin, and the patient's very unusual blood grouping. •

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Subtotal and total parotidectomy for chronic bacterial parotitis*

William G. Hemenway, MD, Raymond O. Smith, Jr., MD, and Gerald D. Harrison, MD, Denver

Chronic bacterial parotitis is characterized by persistent or recurrent painful swelling of the parotid gland and purulent drainage from Stensen's duct. Patients with the disease may or may not have systemic manifestations of infection. In contrast to acute suppurative parotitis, which is almost always caused by Staphylococcus aureus, the most common infecting microorganisms for chronic parotitis are streptococcus viridans and diplococcus pneumoniae.[1] Although antibiotics may control acute exacerbations of the chronic parotitis, further measures are necessary if the patient is to receive permanent relief from the infection. If more conservative measures, such as dilation of the parotid duct, do not eliminate the problem, subtotal or total parotidectomy is an effective surgical procedure which is curative in virtually every case of chronic suppurative parotitis. When the operation is performed by a competent, experienced surgeon the danger of permanent damage to the facial nerve is negligible.

History

Parotidectomy, sparing the facial nerve, was first devised to treat tumors and was later applied to the problems of non-neoplastic lesions. In 1912, Blair[2] described a technic of parotid tumor removal with facial nerve preservation. The operation varied somewhat but was based on observation of the face during surgery and identification and isolation of the branches. In some cases he recommended a direct approach to the main trunk. Sistrunk,[3] in 1921, recommended first finding the inframandibular division and tracing it centrally. Adson,[4] in 1923, recommended finding the cervical branch anterior to the gland and tracing it centrally. Janes[5] of Toronto, in 1940, was the first to recommend routinely finding the main trunk of the nerve rather than one of the smaller branches. This change in technic was an important advance, and it has become the basis for modern parotid surgery. He reported both superficial and total parotidectomy with this technic "without serious injury to the facial nerve" in a series of forty-nine cases, forty-eight of which were benign or malignant tumors. One case was chronic inflammation of uncertain classification in which the entire parotid was removed with some difficulty, leaving the nerve intact but temporarily paralyzed. Hamilton Bailey[6] of England in 1941 reported the feasibility of removing parotid tumors and sparing the facial nerve. He did not expose the main trunk until the gland was freed around it. He claimed that the nerve did not run through the gland, but ran between the deep and superficial lobes. Most surgeons would disagree with this. In 1950 Brown, et al.,[7] described his method of direct approach to the tumor with dissection of the nerve fibers as they are encountered.

Byars,[8] in 1952, reported his technic of isolating the lower division of the nerve, locating it through its constant relation anterior to the posterior facial vein, and applying his method to calculi removal facial nerve repair after injury and suppurative infections. Robinson, et al.[9] reported their technic of supravital staining in parotid gland surgery with one per cent methylene blue injected into Stensen's duct. The dye facilitated differentiation of normal gland from pathologic lesions, and aided the finding and preservation of the facial nerve.

"Parotidectomy in the Treatment of Chronic Sialadenitis" was the title of a paper

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published by Beahrs, Devine and Woolner[10] from the Mayo Clinic in 1961. Of twenty-nine cases done between 1955 and 1960, seventeen patients had typical chronic recurrent parotitis. Subtotal parotid resection was done on all but six patients who had total conservative parotidectomy with preservation of the nerve. In five cases (17 per cent) a temporary facial paralysis ensued, which returned to normal within a few weeks. Morbidity was minimal, and drainage from the wound was not a problem. Criteria for surgery was not clearcut, but depended on the severity of the clinical problem. They stated, "the hazard of injury to the facial nerve should no longer be a deterrent to parotidectomy when this procedure is indicated." Of the patients treated by superficial parotidectomy, only one developed symptoms from residual infection in the deep lobe. This experience influenced the authors to excise the deep lobe in subsequent patients. In 1961, Patey and Moffatt[11] reported on a clinical and experimental study of functional paralysis of the facial nerve following conservative parotidectomy in ninety-five consecutive patients. In thirty-one (32 per cent) there was a temporary paralysis and in thirteen (14 per cent) the temporary palsy involved the entire nerve. Three patients developed some degree of permanent paralysis. The main predisposing factors were total as opposed to superficial parotidectomy, and the irrigation of the wound with perchloride of mercury. They concluded that the most likely cause of functional paralysis following parotidectomy was ischaemic anoxia as a result of interference with the nerve blood supply. Some of these observations were confirmed by doing experimental parotid surgery on a series of rabbits. Patey,[12] in 1963, analyzed the risk of facial paralysis after parotidectomy in a series of sixty consecutive cases of all types, which were performed subsequent to those published in the preceding paper. The nerve had to be sacrificed in four cases, three of which were carcinomas. Partial sacrifice was necessary in seven cases. Gratifyingly little paralysis resulted from sacrifice of up to half the facial nerve, provided that the terminal branches and their interconnecting nerve fibers were conserved (semi-conservative parotidectomy). Little or no functional facial paralysis occurred in forty-five out of fifty-one cases which had conservative parotidectomy.

The senior author has used the technic of subtotal parotidectomy for several years for chronic parotitis which has not responded to conservative management. Results have been excellent in all cases with no permanent seventh nerve damage.

Technic of Operation

The basic incision was described by Lilienthal[13] in 1917. Modern surgical technics have led to better understanding of the disease processes by providing more pathologic tissue for correlation with x-ray and clinical findings. Because of fibrosis, edema and bleeding in the chronically infected tissue, the identification, dissection and preservation of the facial nerve is more difficult and time-consuming in inflammatory lesions than in the average mixed tumor. However, in skilled hands the nerve will not be cut nor will any permanent disability result. The incidence or temporary paralysis due to trauma during dissection should be 25 per cent or less and all function will be normal within three months. In the senior author's experience, functional paralysis has become progressively less with experience, and at present it is unusual, even with residents doing the surgery. The author makes extensive use of a nerve stimulator and a Zeiss operating microscope.

The technic, as described by James,[5] is the identification of the main trunk and careful forward dissection of the superficial lobe from the nerve branches. Wide exposure and a dry field are essential. There is some difference of opinion on whether to remove the deep lobe in these patients. Most surgeons leave it in but Beahrs[10] recommends its removal as he had a residual infection in the deep lobe in one of twenty-three cases. Probably one should remove as much of the deep lobe as possible as a secondary operation would be extremely difficult. Robinson[9] has shown by staining the gland with one per cent methylene blue that the gland cannot be completely removed. The incidence of temporary facial paralysis will increase if deep lobe resection is done. At the termination of the procedure, the nerve will be in full view and will nearly always respond to stim-

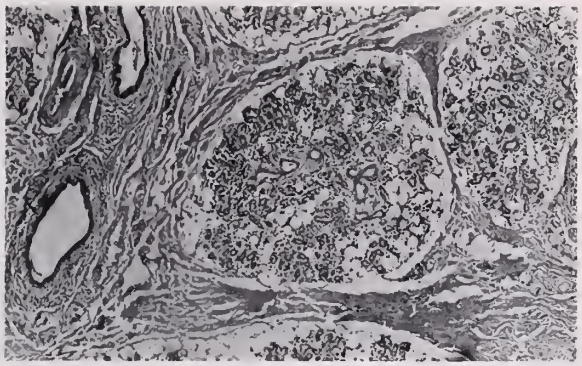

Fig. 1. Histopathology of the excised parotid which shows destruction of the acini and infiltration with polymorphonuclear leukocytes and lymphocytes. There is increased fibrosis of the septae. These changes are compatible with chronic bacterial parotitis.

ulation and thus the surgeon is confident of excellent function. Results are excellent and the patient has been cured of a chronic recurring problem. Both parotids can be removed without any functional difficulty by the patient.

CASE REPORT

A 41-year-old Caucasian male was involved in an automobile accident in December, 1969, and received a blow to the left side of his face. He developed extreme edema and ecchymosis of the left side of his face and left ear, and also sustained several superficial facial lacerations. Over a two week period the facial swelling gradually subsided, and the lacerations healed without apparent complications.

The patient then noted progressive enlargement and tenderness in the region of the left parotid gland accompanied by a foul tasting oral discharge. On January 25, 1970, he was admitted to Porter Memorial Hospital with fever, malaise, an enlarged tender left parotid gland and purulent drainage from the left Stensen's duct. A diagnosis of acute parotitis with abscess formation was made, and therapy was begun with intravenous cephalothin (one gram every six hours) since the patient was allergic to penicillin. Diplococcus pneumonia, which was sensitive to several antibotics, including cephalothin and tetracycline, was cultured from the parotid duct exudate. Three days after admission the parotid abscess was drained through an incision over the posterior and inferior portion of the gland. The gland then rapidly decreased in size and the patient was discharged from the hospital on January 30, 1970, with instructions to take tetracycline, 250 mgm every six hours.

Four days later progressive tender enlargement of the parotid gland recurred and on February 7, 1970, the patient was again admitted to the hospital, and therapy with intravenous cephalothin was reinstituted. A repeat culture of the exudate from Stensen's duct revealed streptococcus viridans. Intravenous cephalothin was continued for fourteen days, during which time the parotid gland size decreased slightly; however, the gland remained tender and noticeably enlarged, and the duct continued to discharge pus. Because of the patient's persistent infection despite intensive antibiotic thereapy, on February 23, 1970, a superficial parotidectomy was performed (G.D.H.).

Microscopic examination of the gland revealed heavy infiltration with lymphocytes and histocytes. The remaining acini were separated by thickened bands of fibrous connective tissue which separated by thickened bands of fibrous connective tissue which surrounded the ducts, blood vessels and nerves. The pathologic diagnosis was moderately severe chronic fibrosing inflammation of the parotid gland. (Fig. 1)

Intravenous cephalothin was continued for the first five post-operative days after which the patient received no further antibiotic therapy. Facial nerve function remained normal. Since the superficial parotidectomy, the patient has had no further signs or symptoms of parotid infection.

Summary

The utilization of partial or total parotidectomy for the treatment of chronic suppurative parotitis is described and discussed. A case of chronic bacterial parotitis which was treated by subtotal parotidectomy with an excellent result is presented. •

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Adverse reactions to oral contraceptives*

Report of a case of cholestasis

V. G. Henry, MD, Cheyenne, Wyo.

An extremely timely subject. Part of the value of this paper is its extensive reference list for those who care to pursue it in more detail.

For several years numerous articles have appeared reporting side effects from oral contraceptives. One has the feeling these reports are becoming more numerous as time and experience permit more detailed evaluation. The subject of adverse effects, apparent or real, is being raised with annoying regularity. Some fifty different side effects, some minor and some major, have been laid at the door of the "pill." Most effects, it is true, are observed within the clinical or laboratory setting, but the long term effects are unknown. One garment manufacturer reports the sale of "C" cup (larger than normal) brassieres have increased 50 per cent in the past 10 years. It is doubtful if better nutrition can account for all of this. Ball,[1] an internist in Muncie, Indiana, states, "I do not contend that oral contraceptives are responsible for all the fat, fatigued, fussy, fluid-filled, infertile females in the country. Maybe the pills are causing only one-fourth of these problems, but this is too much."

Among the many side effects of oral contraceptives mentioned in the recent literature are cytological changes,[2,3,4] thromboemoblic effects, [5-14] liver damage,[5,8,15,16,17] mood changes,[1,18,19] erythema nodosum with production of L. E. cells,[20,21] effects on tumors of the breast,[22,23] increased levels of clotting factors VII and X,[24] hemoconcentration with increased viscosity of the blood,[25] prolonged anovulation and sterility,[26,27,28,29,30,31] adrenocortical insufficiency,[32] cervical cancer or histological changes resembling cancer-like cells,[3,4] hypertension,[33,34,35] hypertriglyceridema,[36,37] increased plasma zinc and copper levels,[38,39] rheumatic symptoms,[40] decreased serum folate levels,[41,42] elevated ceruloplasmin levels,[43] neurologic symptoms,[44,45] migraine,[46] herpes gestationis,[47] lens opacities,[48] increased patulence of the eustachian tubes,[49] candida vaginitis,[50] and endometrial changes.[3]

A statement issued by the Food and Drug Administration on May 10, 1968 lists thirty-four adverse reactions associated with the "pill." This statement was to be used in labeling oral contraceptives.

Hertz and Bailar[3] have raised a number of questions concerning oral contraceptives and the serious limitations in our knowledge of the potential long term effects of such medication. They point out the prolonged latent period (up to 30 years) of all known human carcinogens and that we cannot ignore this in evaluating what is now known about the carcinogenic potential of steroid substances. They quote several studies relating estrogen-progestogen to endometrial and cervical cancer. They also raise an interesting question concerning the ultimate fate of germ cells that have been suppressed

*From the University of Wyoming Student Health Service.

by estrogen-progestogen. If the ovum survives from this suppression is it altered in any way, so that at subsequent fertilization there might be congenital defects or related abnormalities? Again time, controlled studies, follow ups, and the number of such possible infants are not available to give an answer.

Schaffner[51] has pointed out the effects of oral contraceptives on the liver. He lists three patterns that may develop. (1) One pattern occurs in women with recurrent cholestasis of pregnancy. In these patients jaundice with pruritis appeared in the first month of oral contraceptive therapy. This type of reaction appears to result from unusual sensitivity of the bile secretory apparatus. (2) There is the type of jaundice seen with anabolic steroids and probably represents a direct effect of estrogen or protestogens on the bile secretory apparatus. There is cholestasis with no signs of hepatocellular damage or hypersensitivity. (3) The third type shows signs of either hepatocellular damage or hypersensitivity.

It has been recently reported[52,53] that oral contraceptives decrease the hepatic excretion of Bromsulphathalein into the bile and therefore BSP retention is not reliable in the assessment of hepatic function in women taking oral contraceptives.

CASE REPORT

A 22-year-old married, caucasian, female was first seen in the outpatient clinic at the University of Wyoming Student Health Service on the fourth of November, 1969. Her only complaint was itching over her entire body. The onset had begun two weeks before with a gradual increase in intensity. There were excoriated areas on the chest, arms and legs from scratching. For the previous few nights, she had been unable to get a good night's rest because of the itching. When first seen she was obviously icteric, although neither she nor her husband had noticed this change. Preliminary laboratory work showed a total white count of 8,600 with differential of 58 Segs, 34 lymphs and 7 eosins. Hb was 15.4 Gms, and Hematocrit was 47 per cent. Urine was amber, slightly cloudy, reaction 5.0, Sp. Gr. 1.017, Wbc 40-50, many epithelial cells, acetone positive, bile positive, negative for albumin and sugar. She was admitted to the Student Health Infirmary for further tests and care.

Remote history at the student health service revealed only 2 or 3 mild upper respiratory infections and one urinary infection, all occurring

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in 1966. She had the usual childhood diseases and no past serious illness or surgery. Present history revealed no medication except oral contraceptives. She started on C-Quens in January, 1969, at which time she traveled to Africa and Europe. During her overseas travel she had no chills, fever, diarrhea or any minor illness. She returned to the states in June, 1969. She was then off her oral contraceptives for about 1 month, and in August started taking Ovulen -28, which she had continued until seen at the health service.

The following laboratory results were obtained while in the infirmary: On 5 Nov. '69 a catheterized urine specimen showed amber color, clear, reaction 5, Sp. Gr. 1.015, wbc 1-2/hpf., albumin, sugar and acetone negative and a positive test for bile. Wbc was 5,900, Segs 62, Lymphs 31, Monos 3, Eos 3 and Baso 1. Hb 15.8 Gms. Hct 48%. Blood urea nitrogen was 7.8 (8-25 normal), serum bilirubin, direct 9.25 (0-0.4 normal) indirect 7.0 (0.4-0.8 normal), cholesterol 260 mgm% (150-250 normal), serum albumin 3.2 mgm% (3.5-5.6 normal), serum globulin 3.3 mgm% (1.5-3.0 normal), A/G ratio 0.98 (1.25-2.5 normal), bleeding time 1 minute (1-3 normal), coagulation time Lee-White 11.5 minutes (5-10 normal), Prothrombin time 13 seconds (control 14.6 seconds), Thymol turbidity 3.6 units (up to 5.5 normal), SGPT 310 units (0-35 normal), SGOT 280 units (0-28 normal), sedimentation rate 14 (0-15 normal) Alkaline Phosphatase 72 IU units (.9-35 normal), BSP 54% retention (up to 5% normal). On 10 Nov. '69 the SGOT was 240 units, SGPT 310 units, bilirubin direct 11.0 mgm% and indirect 7.75 mgm%. One week later on 17 Nov. '69 the SGOT was 36 units, SGPT 52 units, thymol turbidity 2.6 units, serum bilirubin direct 2.5 and indirect 3.0%.

Her highest temperature was 99.8 on the 3rd day. Pulse ranged between 80 and 90 with an occasional 100. Respirations were steady at 20. Physical examination showed evidence of pruritis and jaundice. There was no abdominal tenderness, hepatomegaly, splenomegaly or adenopathy. The oral contraceptive was discontinued on admission to the infirmary. The biggest problem in management was to relieve the intense itching and try to make the patient more comfortable. To this end periactin, an antipruritic lotion, surfadil, and collodial oatmeal baths were tried. None of these seemed to help to any extent. By 16 Nov. '69 the itching had almost stopped and there was only minimal clinical evidence of jaundice. She was dismissed from the infirmary on 18 Nov. '69 after a 15 day stay.

The patient was again seen as an out patient on 24 Nov.'69. The pruritis and jaundice had both cleared completely. Laboratory tests showed bilirubin, direct 1.25 mgm%, indirect 1.75 mgm%, alkaline phosphate 50 units. The SGPT and SGOT were within normal limits. By 15 Dec. '69 the bilirubin direct was .75 and indirect 1.30, the alkaline phosphatase was within normal limits. On 6 Feb. '70 the Alkaline phosphate was 58 units and on 10 March '70 the alkaline phosphatase was 20 units, serum bilirubin direct was 0 mg%, indirect was .25 mg% and the serum cholesterol was 235 mg%. At this point she was dismissed from our care.

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Comments

In view of the many adverse side effects of oral contraceptives, some serious, and our lack of knowledge concerning long-term effects, it would seem prudent to prescribe this medication with extreme care.

The past and present policy at the University of Wyoming Student Health Service has been to discuss completely all methods of contraception upon request by any student. However, we also feel that the prescribing of a contraceptive should be a matter between the student and her personal or family physician. •

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MEDICAL CONFERENCE
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Presentation: Don Pinkerton, MD, Resident, Department of Pediatrics

Discussion: William M. Michener, MD, Associate Professor, Department of Pediatrics

Jaundice in the newborn*

Case Presentation

J. H. was born in Alaska February 8, 1969. The pregnancy, labor and delivery were uncomplicated. At five weeks of age the local physician noted that he was slightly jaundiced. By eight weeks of age jaundice was more prominent and a serum bilirubin was reported as 4.6 mgm % total with 3.5 mgm% direct reacting. He was referred to a hospital in Seattle where two liver biopsies were performed. The first obtained by percutaneous needle suggested a diagnosis of biliary atresia. An exploratory laparotomy to evaluate possible biliary atresia was then done. Operative cholangiogram and exploration were thought to show a normal left hepatic duct, a very small right hepatic duct, and free flow of bile into the duodenum. Open liver biopsies of both lobes revealed "canalicular plugging and bile duct proliferation." Subsequent microscopic review of the liver biopsies here agreed that they were compatible with the diagnosis of biliary atresia.

Without treatment, the bilirubin fell to 1.2 mgm % during the next two weeks, but the SGOT remained elevated at 240 Frankel units and the SGPT at 150. The child was started on Prednisone 6 mgm bid orally and was next seen 2⅓ months later in Milwaukee, Wisconsin. The bilirubin was reported normal, SGOT 88 Frankel units and the SGPT was 156. Prednisone was gradually discontinued during the next four weeks. The child was seen by us for the first time on November 21, 1969, at which time the bilirubin was 3.1 mgm % with 1.1 direct. The SGOT had risen to 102 units, the alkaline phosphatase was 205 International units (upper limit of normal being about 90). The child had grown and developed normally and the physical examination was completely normal except for a well healed right upper quadrant scar. On January 19, 1970, the bilirubin had fallen to 0.3 mgm % total. However, the SGOT was now 180 and the alkaline phosphatase remained unchanged. An I-131 labeled Rose Bengal liver scan was done which was interpreted as "normal anatomical and functional activity of the liver."

*Albuquerque, New Mexico, February 15, 1970. W. S. Curran, M.D., Associate Editor.

Discussion

To refresh your memory about jaundice, I would like you to think about the pathophysiology of jaundice as it related to the liver cell as depicted by Dr. Sheila Sherlock.[1] Basically there are four causes of jaundice to consider. The first is caused by an increased load of bilirubin being delivered to the liver; the factors affecting the bilirubin albumin water-insoluble complex are important here. The second involves the uncoupling of bilirubin from albumin and the transport of bilirubin across the liver cell wall; we know the least about this stage. Thirdly, once in the liver cell it was thought that the insoluble bilirubin-protein complex simply went to the microsomes for conjugation into a water-soluble complex. Recently there have been described other protein molecules called "Y" and "Z" proteins. "Z" protein is present in larger quantities at birth and "Y" protein is absent and gradually appears, probably in relation to the liver cell's ability to conjugate bilirubin.[2] Therefore, the limiting factor in the newborn's ability to conjugate bilirubin may not be glucuronyltransferase enzyme but may be the appearance of transport proteins. I think more about this will appear in the next few years. Then lastly, once you have a conjugated bilirubin, there are the factors that are involved in the excretion, both intrahepatic and extrahepatic, which we will discuss later.

Simply putting this in a tabular form, we are lucky Mother Nature has given us different causes of jaundice in the first week of life. I think there is probably a large list of drugs and pathophysiologic processes that effect the glucuronyltransferase conjugation system (i.e., anoxia, infection, thyroid deficiency, various competitive inhibition substances). Inheritance and prematurity are two factors that also relate to jaundice persisting after the first week of life as well as the obstruction to the excretion, which we will deal with in more detail.

Fortunately, you can divide the problem of prolonged jaundice in infancy as to whether or not there is present increased conjugated bilirubin. Certainly in the erythroblastotic baby who continues to hemolyze, (and some babies will have a positive Coombs' test up to 4-6 weeks of age), an elevated bilirubin will persist with no direct component elevation. In erythroblastosis there are also situations when the direct component is elevated. Usually this indicates a different complication. Familial neonatal hyperbilirubinemia seems also to be appearing in increasing frequency. Certain mothers will give birth to infants who have an elevated bilirubin and retain this elevation up to maybe 14 or 16 days. If you examine the serum of every pregnant mother in the last trimester for inhibition of glucuronyltransferase conjugation, all will show some inhibitory effect. Certain mothers will have approximately 5 to 10 times as much inhibiting substance in their blood, probably is related to a specific hormone, and these mothers are relatively easily identified. The Crigler-Najjar syndrome, a deficiency or absence of the glucuronyltranferase, we are all familiar with. One of the advances in the last few years is that Dr. Arias has defined two different syndromes, Type I and a Type 2.[3] Type 1 is the infant with a bilirubin usually between 20 and 40 mgm % total (less than 1-2 mgm % direct). This type is usually an autosomal recessive. These infants are prone to bilirubin encephalopathy. The bile in the gallbladder will be clear, not yellow, and will not contain conjugated bilirubin. If you gave this infant phenobarbital the serum bilirubin would not fall. This baby probably has a total deficiency of glucuronyltransferase. Type 2 is the baby that has a serum bilirubin usually less than 20 mgm % all in the unconjugated form, and as a rule does not develop bilirubin encephalopathy. If you aspirate bile from the gallbladder, the bile is yellow, and conjugated bilirubin is present; if you give this baby phenobarbital, in 72 hours the bilirubin will begin to fall rather drastically. Breast milk contains, in some women, a 20 alpha-beta pregnanediol which *in vitro* and *in vivo* inhibits conjugation; these infants will retain an elevated bilirubin of the unconjugated type usually until breast feeding is stopped. Then, in 48 hours, as though the brakes have been taken off, the liver begins to conjugate and the serum bilirubin falls. Mothers can resume breast feeding and the bilirubin will remain normal. This is an inhibitory substance to the conjugating system.

There are several drugs that will inhibit the conjugating system. Certainly the old Vitamin K's in the high doses 5 or 19 mgm., which every infant or mother received, would do this. Some infants of diabetic mothers also will become jaundiced. Exactly why these infants get jaundiced is not known; dehydradation, steroid inhibition of the glucuronyltransferase system or glucose deficiency as a substrate in the glucuronyltransferase system may contribute. Anoxia, hypothyroidism and pyloric stenosis have all been noted to have prolonged jaundice.

Now I would like to consider those conditions causing elevation of the total bilirubin with elevation of the direct reacting fraction as well. These include biliary atresia, neonatal hepatitis, sepsis, erythroblastosis, and idiopathic infant cirrhosis. There are several rare types of the latter, such as Biler's disease seen in the Amish. Certainly infections (i.e. Escherichia coli, toxoplasmosis, cytomegalic inclusion disease) produce a liver biopsy picture that is not unlike that of the neonatal hepatitis. Galactosemia produces rapidly advancing fibrosis in the periportal areas resulting in early jaundice; the urine should be checked for reducing substance to establish the diagnosis; the toxic substance to the liver is not thoroughly understood. The erythroblastotic infant is of interest in that three situations are noted when the conjugated bilirubin is elevated. In severe erythroblastotic, infants with elevation of the direct reacting bilirubin in the cord blood have a poor prognosis. In

one study of 37 patients[4] with elevation of the direct reacting bilirubin, there was a 75 per cent mortality rate in the first month of life, so this probably represents a very severe toxic intrauterine effect on the liver. The second situation would be in the infant who has exchange transfusions and continues to have red blood cell destruction but gets some damage to the umbilical vessels from the catheter itself. These are rare, but have been reported. In the third situation, formerly called the inspissated bile syndrome, the infant continues, after his exchange transfusions, to run an elevated bilirubin. Hemolysis is still going on but direct reacting bilirubin is present. This probably is not just a plugged up biliary excretory system but represents neonatal hepatitis.

If you have a 4-week-old baby who has an elevated bilirubin with approximately a 50 per cent direct reacting fraction, what are the betting chances on the diagnosis? Biliary atresia will cause approximately 60 per cent, neonatal hepatitis, approximately 20 per cent, and the rest of the group making up the other 20 per cent. In biliary atresia only about 10 or 12 per cent of the anatomical embryologic defects of the extrahepatic system can be repaired. Usually half of these will survive. Therefore, we really are interested in recognizing in this group those causes which are amenable to antibiotic or surgical therapy and also recognizing those causes that can be made worse by being too rigorous in our approach to establishing the diagnosis. Now let us go more in detail into the atresia and hepatitis problems.

If you approach logically the workup of the baby with prolonged jaundice, there are three aspects of function that need exploration. You want to know what is going on in the blood, secondly, the state of the liver cell function and, thirdly, the patency of the biliary excretory system. The needed blood studies are obvious — hematocrit, blood type and Rh, and the morphology of the cells. The presence or absence of reticulocytes indicates two facts: 1) whether or not hemolysis is present, and 2) whether there is extramedullary hematopoiesis in the liver as occurs in some patients with neonatal hepatitis. In terms of liver function tests, the serum bilirubin is probably the best. The serum protein electrophoresis gives some idea of synthesis function of the liver. The prothrombin time is important as an indicator of liver function and also is important as it relates to bleeding at surgery. The SGOT was initially advocated as "THE" test. It should be high in hepatitis and low in biliary atresia but in some 62 determinations at Toronto Children's[5] on 23 patients, 11 biliary atresias and 13 neonatal hepatitides, there was a total scattering. This variation relates to the duration of the obstruction to bile flow; the longer it is obstructed, the more liver cell damage present. The serum alkaline phosphatase is not helpful in babies; it is difficult to evaluate in growing children, much less in the early weeks of life.

In the examination of biliary excretory system patency, the liver biopsy, the cholangiogram, and the I-131 labeled Rose Bengal dye liver scan are important. A chloride sweat test to rule out cystic fibrosis should be done, since an occasional cystic patient will present with jaundice. Blood serology and certainly blood cultures should also be done.

Now, back to the liver biopsy—the needle biopsy is not without risk in the small infant whereas the open biopsy and the cholangiogram require abdominal exploration. Some physicians have argued that watchful waiting is better than operating on a jaundiced baby as he does not withstand the effects of anesthesia well. I think that the complications of anesthesia are directly related to the duration of the anesthesia. This should be a very short operation through a small incision. The surgeon identifies the gall bladder, if it is there, places a catheter in the tip of the gall bladder, does a cholangiogram, and, while waiting for the films, does the liver biopsy. The operation should not take more than 30 or 40 minutes. Most surgeons do not feel that with good anesthesia, good oxygenation and good carbohyrate preparation that the risk is great. Therefore, it is probably the procedure of choice as you will see in just a moment.

Now, let us look at the clinical aspects of these babies. It is a misconception that one may differentiate biliary obstruction from hepatitis by the difference in skin color—green jaundice and light yellow jaundice—and also that the onset of jaundice may be different. Basically, there is nothing in the clinical course that can differentiate the two. The stools can vary in color with total obstruction for reasons that are not totally understood. The onset in both is usually gradual and subtle. Jaundice is noted around the second or third week, frequently by someone outside the family. Jaundice can begin in the nursery. It seems to fluctuate to our eye and may actually fluctuate by measurement. The indirect reacting bilirubin will tend to decrease or the direct reacting increases as the duration of the disease progresses. The nutrition in these babies varies, which is another aspect that is poorly understood. Babies who are severely jaundiced may appear well, and die suddenly from esophageal hemorrhage, while others appear severely malnourished survive indefinitely.

I did not mention choledochal cyst, neoplasm and teratoma in the differential diagnosis as they are quite rare. In 52 cases of liver tumors reported by Dr. Clatworthy, not one presented with jaundice.[6] All presented with abdominal masses; later many became icteric. The metabolic storage diseases involving the liver are seen but are also quite rare.

The I-131 Rose Bengal excretion test is a major advancement in dealing with this problem. If you remember, in 1961 Drs. Brent and Geppert described this technic[7] and then the Toronto Children's group also described its use.[8] Now with the

new scintillation counters, this is an excellent technic. Rose Bengal is a tetraiodo-synthetic dye that is almost entirely cleared by the liver in a single passage. Lugol's solution (10 drops) is given orally approximately 6 to 24 hours before to block the uptake of the isotope by the thyroid. I-131 rose bengal is injected intravenously, cleared by the liver and excreted into the gut, or if an obstruction is present, concentrates in the liver then refluxes into the blood stream and is excreted in the urine. The original technics depends on the detection of the isotope in the stool and urine. One small urine spillage into the stool contaminates the stool and invalidates the test. This is a real problem in a small girl.[7] How can you separate a 72-hour stool and urine collection; it is simply impossible to do.

Abdominal scintillation counting is simply a scan of the abdomen and with the older scanners a baby had to lie very quietly for at least 45 minutes to scan the whole abdomen. Now the entire scan can be done in a matter of a couple of minutes. We also can now determine an uptake, a storage and an excretion curve. A scan done between 30 and 60 minutes after injection gives the outline of the liver. The next scan is at 24 hours after injection and if there is radioactivity in the small bowel, no complete obstruction is present. This can be done as an outpatient procedure, and is a good reliable test.

The next slide shows a scan in a biliary atresia patient—a bigger liver, a greater concentration of isotope; this scan was performed 1⅓ hours after injection, and then 24 hours later the same appearance with no radioactivity seen in the small bowel. If you look at the 36 to 72 hour scans, you would see the same liver outline but it would gradually become less dense as the radioactivity is getting diffused into the blood. This is a very reliable simple test and, in my opinion, if you are going to do one test, this is the test that yields the most information.

I would recommend that you read the article by Hayes, D.M., et al, in the Journal of Pediatrics, Vol. 71 1969,[9] on the diagnosis of biliary atresia, paying specific attention to the comments on interpretation of cholangiograms. Wide variations are seen in cholangiograms. They can be dilated, constricted, right hepatic duct missing, left hepatic duct missing. Our patient illustrates this problem, as I am sure this child does not have extrahepatic biliary atresia. He had a variability in his cholangiogram: an undilated cholangiogram that demonstrated a very narrow right hepatic system. This is probably a disuse phenomena that is the result of severe hepatitis. We can visualize the gall bladder, the common duct, radiopaque material back up in the liver with early branching of the duct system. What you see intrahepatically in a cholangiogram is really unreliable in terms of making any type of diagnosis such as intrahepatic biliary atresia. Cholangiograms can show proximal atresia of both hepatic ducts and the common duct, as in our patient. Sometimes we see a narrow undilated duct and sometimes peculiar segmental dilatations with nothing visualized inside the liver. Yet these infants may have tiny intrahepatic ducts and if heroic measures are avoided can survive.

Several anomalies are surgically correctable. A section of jejunum can be anastamosed to a duct stump to establish bile flow. Unfortunately, the prognosis after correction is not good because of the liver damage that is present; many infants even with correction often go on to develop cirrhosis and esophageal varices.

Liver biopsies, early in biliary atresia may demonstrate a consistent pattern. There does not appear to be much disorganization and bile laking is present. In neonatal hepatitis there is extramedullary hematopoeisis and many multinucleated giant cells are usually seen. The appearance of bile ducts is difficult to interpret; whether you have a decrease in the intraluminal duct system or early budding ducts is often difficult to decide.

We are interested in how to make the diagnosis of the type of jaundice the easiest way with the least amount of error. If one examines needle biopsies, open biopsies and cholangiograms, the needle biopsies have a fair degree of error. By error, it means that at autopsy or surgery, biliary atresia was mistaken for neonatal hepatitis, or vice versa. By doing an open biopsy, you reduce the error but increase the number of questionable

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diagnoses. If the open biopsy and cholangiogram are done together, this is your best combination to make the appropriate diagnosis. This assumes that the I-131 labelled rose bengal was not excreted by the liver.

What can we do for some of these patients? The use of antibiotics is appropriate, of course, if you can establish that infection is present. These patients also are susceptible to intercurrent infections, so careful follow-up for treatment of infection is necessary. Nutrition is important. A good, high caloric diet and vitamin supplements are important, as biliary atresia or any form of obstructive liver disease that does not allow bile salts to get into the GI tract will lead to diarrhea and malnutrition. The prevention of hemorrhage by use of Vitamin K_1 Oxide is obvious. The use of steroids is questionable. There is no good controlled study on the use of steroids in these patients, and no evidence that steroids change the utimate outcome of the pathologic process. It may be that steroids will help an acutely ill hepatic problem, but in terms of the long-term prognosis, I do not think we have that evidence. This is information badly needed.

Question: I am concerned about the urgency of performing a cholangiogram or biopsy. In short, at what stage of the game do you have irreversible liver damage?

Dr. Michener: Of course, this really the crux of the matter. Our teaching has been that it must be done early because this is an ongoing progressive pathologic process, and if you do not do it, biliary obstruction will produce more liver cell damage. I do not think this is wholly true. I think that most of the liver damage is present and that you are not as pushed as one might think. Here, the rose bengal test helps. If dye gets out of the liver, then one can observe the patient longer. In those that do not excrete rose bengal from the liver, I think exploration with liver biopsy and cholangiogram should be done around 6 to 8 weeks of age. But I would need serial biopsies every two weeks showing that progression was going on to prove atresia. I do not have data to prove this concept; it is only my impression. I think this is a reasonable approach because the rose bengal scintogram is going to separate approximately 79-80 per cent of these. •

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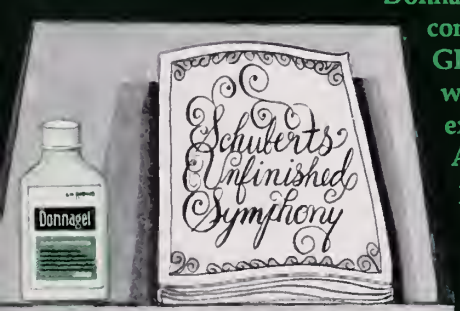

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Infectious mononucleosis and Gaucher's disease in a child

Phongjan Hathirat, MD*
Montreal, Quebec, Canada

INFECTIOUS MONONUCLEOSIS can mimic many disease states, particularly leukemia, by the presence of hepatosplenomegaly and lymphadenopathy. However, it may sometimes be associated with leukemia.[1,2] Gaucher's disease is also a cause of hepatosplenomegaly, and Gaucher's cells have occasionally been found unexpectedly in other causes of hepatosplenomegaly such as chronic leukemia.[3] This is the first report of a child who had diagnosis of both infectious mononucleosis and Gaucher's disease.

CASE REPORT

A 6-year-old Caucasian boy was admitted to The Children's Hospital in September 1968 for the evaluation of hepatosplenomegaly which was found at the time of a yearly physical checkup. One week prior to admission, he had diagnosis of "purulent tonsillitis" and his symptoms went away after two days of treatment with erythromycin. Past and family history were not contributory.

Physical examination on admission revealed a well-developed and fairly well-nourished white male with slight pallor. He was afebrile and had moderately enlarged and erythematous tonsils. A few 1 x 1 cm. lymph nodes were palpable along the anterior and posterior cervical chains. The liver and spleen were palpable 5 and 10 cm. respectively below the costal margin in the midclavicular line. (The spleen was palpable at the iliac crest). The rest of the physical examination including ophthalmologic examination, were unremarkable.

TABLE 1

1. Complete Blood Count: hemoglobin 10:8 gm%, hematocrit 32%, white blood cells 8900/mm.,[3] 19% segmented, 1% band, 1% basophil, 1% eosinophil, 4% monocytes and 74% lymphocytes (19% were Downey's cell Type II). Occasional basophilic stippling of red blood cells. Retriculocyte count 5.7%, platelets 492,000/mm.[3]
2. Infectious mononucleosis tests:
   a. Mono Spot Test: positive.
   b. Heterophile titers: sheep cell 1:224, guinea pig kidney absorption 1:224.
3. Bone marrow showed erythroid hyperplasia and histiocytes characteristic of Gaucher's cells.

The laboratory findings are shown in Table I. The blood smear was classical for infectious mononucleosis, which diagnosis was confirmed by the Mono-Spot Test and heterophile titers. Because of the unusual degree of splenomegaly, a bone marrow examination was performed and showed typical Gaucher's cells (Fig. 1).

Follow-up examination two months later revealed that the spleen was palpable 3 cm. and the liver 1 cm. below the costal margin. Six months later, the spleen was no longer palpable.

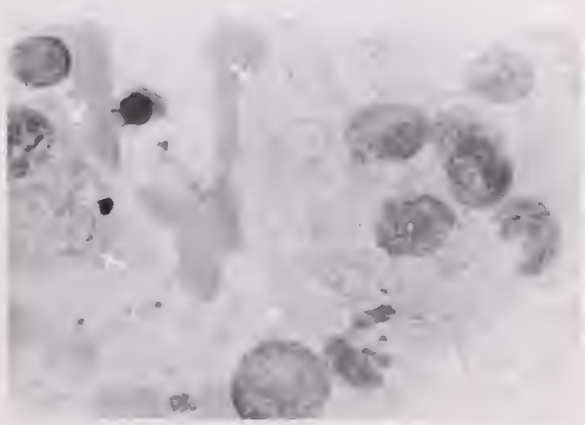

Fig. 1. Gaucher's cells in the bone marrow.

*From Children's Hospital, Denver, Colorado.
Dr. Hathirat was formerly a Fellow in Pediatric Hematology at Children's Hospital.

Comments

Although there was sufficient clinical and laboratory evidence for the diagnosis of infectious mononucleosis in this patient, the excessive splenomegaly suggested an underlying or an associated disease. This led to a bone marrow examination which showed typical Gaucher's cells. This case serves to remind us that associated conditions may exist in the presence of non-proportional organomegaly. •

ACKNOWLEDGMENT

The author would like to thank Dr. Philip L. Lewis for his permission to study and to report this case and Dr. John H. Githens for his invaluable advice.

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Basal cell carcinoma with metastases - -

*Report of two cases**

Thomas E. Hall, MD, William M. Tappan, MD, and James W. Decker, MD, Reno, Nevada

IT IS ALMOST A medical axiom that basal cell carcinomas do not metastasize. Indeed, considering their great frequency, the number of cases reported in the literature demonstrating metastases is small.[1,2] The rarity of metastasis can cause diagnostic difficulties when one is faced with a clinically manifest spread of tumor, as the following cases illustrate.

CASE REPORTS

Case 1: A 62-year-old Caucasian male had a basal cell carcinoma over the sternum excised in February, 1954 (Fig. 1). Local recurrences were excised in May 1954, and in July, 1955. Basal cell carcinomas from the right ear and nose, and a squamous cell carcinoma from the left arm were excised during the next six years.

In November, 1963, a small nodule developed in the left axilla. This was excised and reported as "metastatic adenocarcinoma in subcutaneous tissue." No definite lymph node was identified in this tissue. (Fig. 2).

In 1965 and 1968 additional squamous cell carcinomas were removed from the left temple right ear, and left ear. During this time the patient's general health was good. A residual nodule in the axilla remained stationary in size without additional treatment. A total of ten benign solar keratoses from the head, neck, chest, and hands were removed between 1955 and 1968.

In 1969 the patient developed rib and vertebral metastases, confirmed by rib biopsy in July. He died in October, 1969, at age 77. At autopsy there was extensive metastatic basal cell carcinoma involving ribs and vertebrae, (Fig. 3), identical with the tumor found in the axillary lesion in 1963.

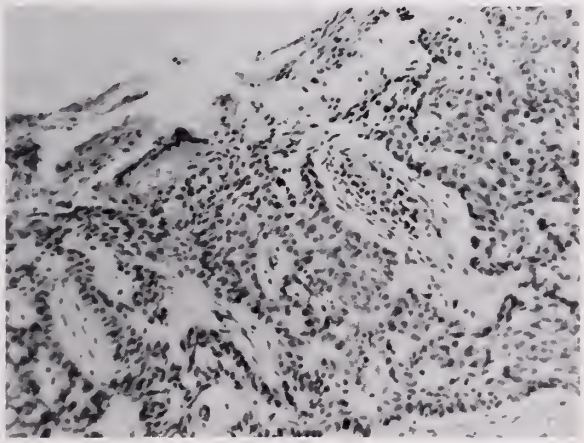

Fig. 1. Basal cell carcinoma of skin of sternum of Case 1. (H and E, X 100)

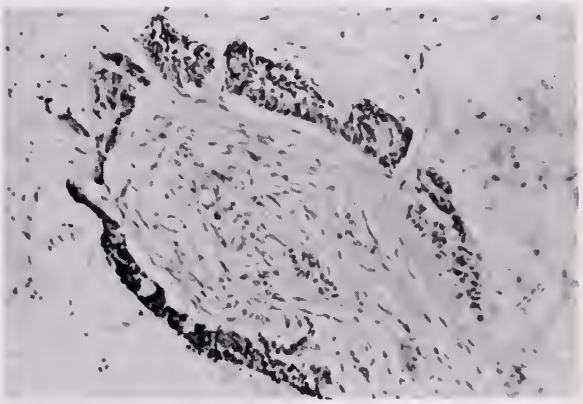

Fig. 2. Basal cell carcinoma, metastatic to axillary lymph node of Case 1. (H and E, X 100)

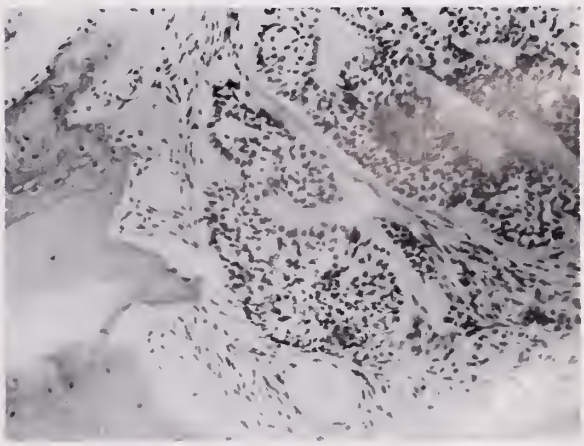

Fig. 3. Metastatic basal cell carcinoma in vertebrae at autopsy, containing small focus of squamous metaplasia of Case 1. (H and E, X 100)

*From the Washoe Medical Center and Physicians' Consulting Laboratories, Reno, Nevada.

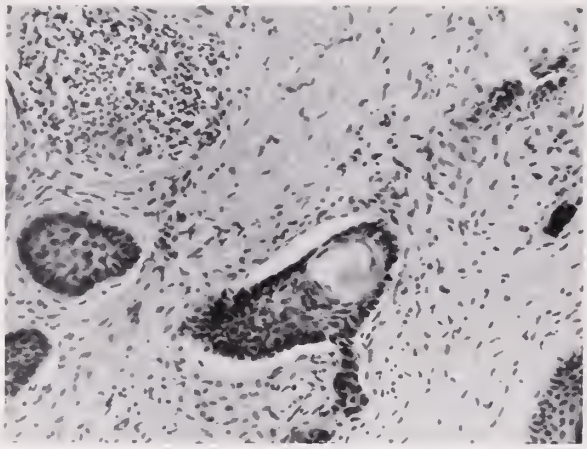

Fig. 4. Focus of recurrent basal cell carcinoma in orbital skin graft, of Case 2. (H and E, X 100)

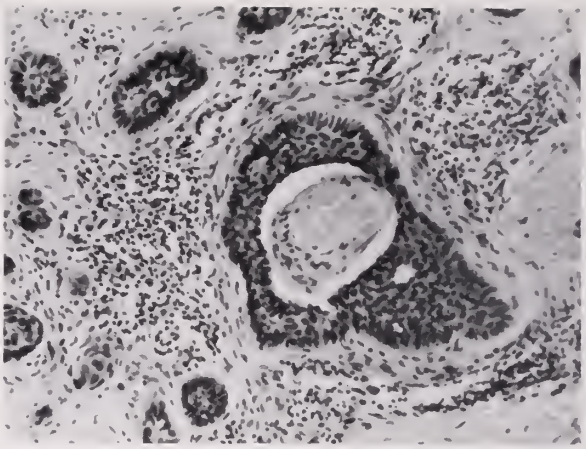

Fig. 5. Basal cell carcinoma, metastatic to lymph node at autopsy of Case 2. (H and E, X 100)

Case 2: A 36-year-old Caucasian male was treated for a lesion of the inner canthus of the right eye with radiation, multiple surgical procedures, and a "paste." In 1955 an exenteration of the right orbit was performed. In 1962 the upper lobe of the left lung was removed for metastatic basal cell carcinoma. Recurrent basal cell carcinoma was removed from the orbital skin graft in 1963. (Fig. 4).

In 1965 a decompression laminectomy was performed at T8-10 because of back pain, disclosing grossly evident tumor extending from the vertebral body and displacing the spinal cord posteriorly. Pathologic examination revealed basal cell carcinoma in bone. In 1966 the patient was treated with 5-fluorouracil when chest x-ray revealed metastatic nodules in both lung fields. These progressed despite treatment with Actinomycin-D. He expired in January, 1967, at age 63.

At autopsy there was residual basal cell carcinoma near the right orbit, and metastatic basal cell carcinoma in the lungs, vertebrae, dura of the thoracic spine, hilar lymph nodes (Fig. 5) and periaortic soft tissue.

Discussion

Because of its very rarity, the initial two metastatic presentations in Case 1 (lymph node and rib) were not recognized as being basal cell carcinoma, despite a relatively typical microscopic appearance on review. It was not until a deep-seated occult primary, such as oat cell carcinoma of the lung, had been excluded at autopsy that the true nature of the tumor became evident.

Although foci of squamous metaplasia and a tendency for central whorling of cells can be seen in both the primary tumors and in the metastases, this occurence is sufficiently frequent in random basal cell carcinoma to be of little prognostic import.

Summary

Two cases are presented of patients with basal cell carcinoma of the skin becoming extensively metastatic to bone and other viscera. Although metastasis from basal cell carcinoma is rare, one can not entirely exclude a known basal cell carcinoma of the skin as a possible primary source when confronted with metastatic disease. Note is made of central squamous metaplasia in several of the primary basal cell carcinomas as well as in the metastases. •

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Segmental infarction of the spinal cord*

Associated with thrombosis of the abdominal aorta

John P. Allen, MD, Portland, Oregon

This case represents an example of infarction of a segment of the thoracic spinal cord associated with thrombosis of the abdominal aorta. The case history suggests that infarction of the spinal cord results when hypotension coexists with an impairment of the circulation to the spinal cord.

INFARCTION OF THE spinal cord is a rare complication of medical disease. This rarity is likely because of two factors. First, there is a rich arterial supply to the spinal cord which is rarely impaired enough to result in an infarction unless the primary obstruction factor is coexistent with a process that causes hypotension. Secondly, the spinal cord is more resistant to hypoxia than other parts of the central nervous system. Because of the complexity of the anatomic relationships between the blood supply to the spinal cord and the neurologic sequella resulting from interruption of part of the blood supply to the cord, it is frequently difficult to make an accurate clinico-pathologic correlation. These anatomic relationships have been well studied by numerous investigators.[1-9] In general the cervical and upper thoracic cord is supplied by branches of the vertebral, ascending cervical (a branch of the inferior thyroid), the deep cervical and the superior intercostal arteries. The remaining thoracic and upper lumbar regions are supplied by the intercostals and lumbar arteries. The lower lumbar and sacral regions are supplied by iliolumbar and lateral sacral arteries. However, considerable variation in blood supply can occur which adds greatly to the variety of clinical and pathologic syndromes which can be associated with impaired circulation (relative or actual) to the spinal cord.

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CASE REPORT

A 55-year-old male entered the hospital having been found at his home lying on the floor unable to move his legs. He did not know how long he had been in that condition, but did complain of severe abdominal pain at the time of admission.

On physical examination he was slightly disoriented with cyanotic, cold, pulseless and paralyzed lower extremities. His abdomen was distended with absent bowel sounds. He was areflexic in his lower extremities and a distinct sensory level was present at T10.

Laboratory studies included a lumbar puncture showing bloody CSF, containing 630 RBC's (90 per cent crenated) with a protein of 80mg per cent. His WBC was 12,300 with 81 neutrophils and 16 lymphocytes. A hematocrit was 55 per cent. His electrolytes were normal and his amylase was 72 units. An EKG was normal.

Eight hours after admission he was operated upon for suspected aortic occlusion. An infarcted large bowel and small bowel was found in association with a non-pulsile aorta below the level of the superior edge of the pancreas. He expired 36 hours after surgery.

A general autopsy confirmed the recent infarction of the abdominal viscera secondary to acute thrombosis of the abdominal aorta. In addition, a small perforation of the right atrium of the heart was present. The etiology of the perforation was unknown as there was no gross evidence of trauma or microscopic evidence of an acute myocardial infarction. A large atheroma

occluding approximately two-thirds of the normal diameter of the right coronary artery was present. The neuropathologic examination revealed a normal brain. The only finding was a softening in the spinal cord from approximately the T8 to T10 levels. No evidence of an associated hemorrhage, extension of the softening beyond the primary lesion, or decrease in the size of the motor or sensory roots was present. Selected sections were obtained from regions above, below and through the area of softening to include the cervical, thoracic, lumbar and sacral spinal cord. They were stained with hematoxylin and eosin (H&E), Holmes and luxol fast blue periodic-acid-Schiff (LFB-PAS). There was no evidence of an occlusion of the anterior spinal artery in the sections obtained. The only pathologic finding was in the area of the softening where a complete disruption of the anatomic relationships of the anterior horns to the anterior and lateral funiculi was present. This was evident by a minimal loss of anterior horn cells and considerable edema within the white matter, typified by swollen axons but without the presence of PAS positive material. There were several small vessels in the region of maximum anatomic distortion which contained organized thrombi.

Discussion

Because of the complex and numerous sources of arterial blood to the spinal vascular system, occlusion of part of its supply is rarely enough to produce an infarction; however, if hypotension occurs in patients who have a marginal or blocked blood supply to a regional zone, an infarction can occur.[10] In all probability an acute hypotensive episode secondary to an early incomplete thrombosis of the aorta, or vago-vagal episode from the severe pain, resulted in an infarction of the spinal cord with complete thrombosis of the abdominal aorta following.

The peculiar finding of a normal spinal cord in the region normally supplied by branches of the abdominal aorta is most logically explained by the transient hypotensive episode. At a time when a partial thrombosis of the aorta was present, dilatation of blood vessels in the legs from ischemia and hypoxia could occur. This could result in stasis and pooling of blood in the lower legs causing a transient hypotensive episode. Following the hypotension, two events probably occurred. First, an infarction of the spinal cord occurred in the "water shed" area between the superior and inferior portions of the anterior spinal artery (Fig. 1). Secondly, completion of the thrombosis of the abdominal aorta followed. This event allowed the lower portion of the spinal cord in the area normally supplied by the abdominal aorta to be perfused via the superior portion of the anterior spinal artery with a complete change in the normal direction of the flow through the thoracic region of the artery. Thrombosis of the aorta by itself, without a hypotensive episode, would have resulted in an infarction of the entire inferior portion of the spinal cord and not a segmental infarction as was observed pathologically.

There are three other pathologic entities which could have resulted in a spinal cord infarction in this case. A complete segmental thrombosis of the anterior spinal artery

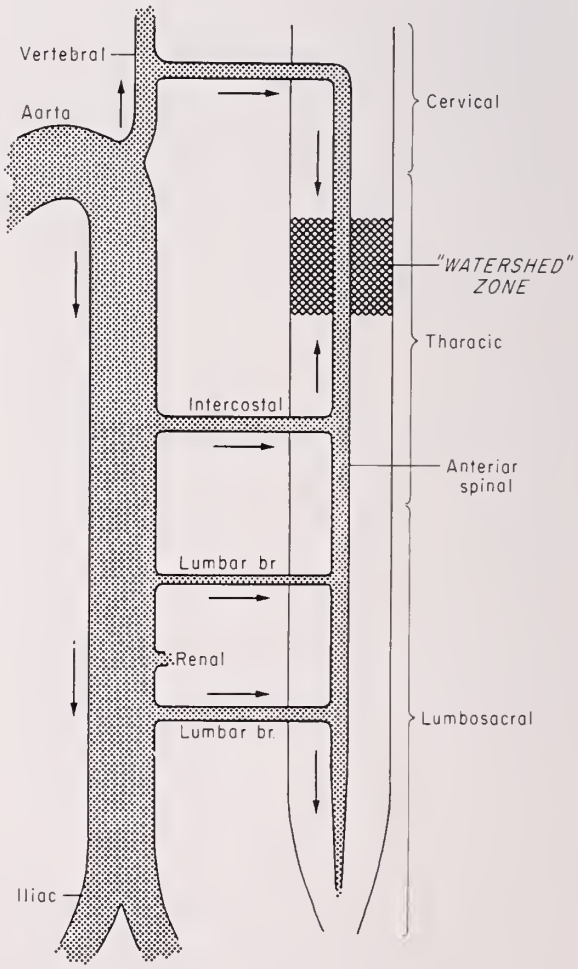

Fig. 1. Schematic representation of the principle sources of the anterior spinal artery with arrows denoting the normal direction of flow. Hatched area shows the "watershed" zone between the superior and inferior portions of the anterior spinal artery.

would have been unlikely since the lower thoracic, lumbar and sacral portions of the spinal cord normally receive their blood supply from the abdominal aorta. If a complete thrombosis of the anterior spinal artery was present, then an infarction inferior to the palpable softening involving the lumbar and sacral regions would have been present in the area supplied by that artery. However, this caudal portion of the spinal cord was normal and no thrombus was found in the artery after pathologic examination. The other two possibilities would include trauma to the spinal column with secondary injury to the spinal cord, and embolism to a segment of the spinal cord. The former is unlikely as there was no evidence of trauma clinically or at the autopsy. An arterial embolus under these circumstances could account for the syndrome clinically, but the thrombi were composed of disintegrating erythrocytes and not platelets. Furthermore, the lesion was not hemorrhagic, as would be expected with an embolus to the anterior spinal artery resulting in an infarction. Other causes or precipitating factors which have resulted in spinal cord ischemia or infarction are listed in Table I.

TABLE 1
MAJOR CAUSES OF INFARCTION OF THE SPINAL CORD

Aortic causes
- Dissecting aortic aneurysm[11]
- Atheromas[11]
- Aortic surgery[10,12,13]
- Thrombosis of the aorta[14,15]

Spinal cord trauma
- Birth injury[16]
- Mechanical trauma from many sources

Infections
- Tuberculosis[19]
- Syphilis[20]

Others
- Cervical spondylosis[18]
- Malignant tumors[21]
- Myocardial infarction[22]
- Air embolism[23]

Although atheromas of the aorta are extraordinarily common, damage to the spinal cord rarely occurs. Hughes has reported three cases in which the clinical course of a chronic paraparesis was demonstrated by postmortem examination to be caused by aortic atheromas.[11] The dissecting aortic aneurysm is undoubtedly the most common cause of spinal cord ischemia which is in part the result of compression of the intercostal and lumbar arteries. Because of the high incidence of shock and hypotension in this disorder, it is most probable that hypotension is as much a precipitating factor leading to spinal ischemia or infarction as the impairment of its blood supply. Spinal cord ischemia rarely occurs after surgical procedures are performed on the abdominal or thoracic aorta.[12] However, Adams and Van Geertruyden have reported 24 cases of spinal cord ischemia in their series.[13] Infarction of the spinal cord has been reported in thrombosis of the aorta[14,15] but in these cases a thoracic "water shed" infarction was not present. Other reported causes of spinal cord ischemia or infarction are birth trauma,[16] collagen diseases,[17] cervical spondylosis, [18] tuberculosis,[19] syphilis,[20] malignant tumors compressing part of the arterial supply to the spinal cord[21] and traumatic injury to the spine. Also, ischemia of the spinal cord from an embolism following a myocardial infarction has been reported.[22] An air embolism to the spinal cord has been reported to occur in Caisson's disease.[23]

The diagnosis of an acute segmental infarction of the thoracic cord was supported by the presence of edematous nerve fibers in the involved segment associated with disruption of the anatomic relationships of the anterior funiculi and the anterior horns. Since there were approximately 48 hours from the onset of his initial difficulty, one would not find PAS positive material or axonal degeneration characteristic of an older lesion.

The exact physiologic mechanism of how infarction occurs in "water shed" zones is not entirely known. This case supports the concept proposed by Bartsch and Swank[24] that marked slowing of blood through capillaries could produce a level of hypoxia of such a degree that tissues are irrevocably damaged. Particularly susceptible are capillary beds which form anastomoses between arteries that supply different areas in the central

nervous system ("water shed" zones). Furthermore, the electrokinetic mobility of erythrocytes and platelets have been shown to decrease up to 40 per cent during "shock" from trauma[25] and in acute hypotension.[26] As a result of this decrease in negative electrical potential on the surface of these blood elements, there would be a greater tendency for contact and aggregation of platelets and erythrocytes. The finding of microthrombi only in the "water shed" zone of the spinal cord is evidence in favor of this hypothesis.

Conclusion

This case represents an example of a segmented spinal cord infarction following a presumed hypotensive episode associated with thrombosis of the abdominal aorta. The probable mechanism of infarction in a "water shed" zone was considered as the clinical course and pathologic findings support the idea that an infarction occurs from slowing of blood in these capillary beds. •

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Tracheal resection with end-to-end anastomosis*

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Through a cervical incision, resection of the mediastinal trachea with a primary end-to-end anastomosis was performed for a tracheal adenocystic carcinoma in a 34-year-old man. This procedure is the treatment of choice for such lesions. Technical details of the operation and the lesion are discussed.

PRIMARY TRACHEAL TUMORS are rare, and until recently, have been difficult to cure. It was not until the early 1960's, when Grillo reintroduced tracheal resection with primary end-to-end anastomosis, that a satisfactory form of treatment was available. Our interest in this subject was re-awakened by a patient who had a tracheal adenocystic carcinoma requiring tracheal resection.

CASE REPORT

A 34-year-old man was admitted to General Rose Memorial Hospital on January 30, 1969, with a chief complaint of wheezing and coughing up blood for six months. These symptoms were suddenly relieved in September, 1968, when he coughed up a piece of tissue, 1.0 cm in diameter, microscopically diagnosed as an adenocystic carcinoma. A chest x-ray performed three weeks prior to admission demonstrated partial atelectasis of the right upper lobe. He was admitted to the hospital with the presumptive diagnosis of a bronchial adenoma.

In the hospital, his chest x-ray had returned to normal. Bronchoscopy demonstrated a 1.0 cm. friable, soft tumor on the right tracheal wall, 20 cm from the teeth, and 8 cm below the vocal cords. Biopsy revealed an adenocystic tracheal carcinoma.

On February 25, 1969, tracheal resection was performed. A transverse neck incision was made two cm above the clavicles and extended laterally beyond the sternocleidomastoid muscles. The upper skin flap was raised up to the hyoid bone. The lower skin flap was raised to the manubrium, the strap muscles split in the midline, and the thyroid isthmus divided. The anterior surface of the trachea was exposed and mobilized by finger dissection down to the carina. The posterior tracheal wall was also mobilized as far as possible into the mediastinum. Care was taken not to disturb the vascular, lateral supporting tissues of the trachea.

Since the tumor could not be seen or felt from outside the trachea, an assistant inserted a bronchoscope into the trachea down to the lesion. A needle was inserted from the operative field into the tracheal lumen enabling the bronchoscopist to precisely locate the tumor 2.5 cm below the manubrial notch. The trachea was opened 5 mm proximal to the lesion, and stay sutures were placed in the edges of the distal trachea. An endotracheal tube was now inserted through the operative field, and control of the patient's airway was returned to the anesthesiologist. The trachea was now completely divided and the posterior tracheal wall more completely mobilized, using the stay sutures for counter-traction. Three tracheal rings were excised circumferentially, including the tumor with adequate margins. The two ends of the trachea were anastomosed with a single

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layer of 3-0 monofilament polypropylene sutures. The sutures were placed around one tracheal ring at each end. The sutures entered the tracheal lumen. All knots were placed outside the tracheal wall. The posterior row of sutures was inserted and tied. The endotracheal tube in the operative field was removed and the distal trachea was reintubated through the nose. The anterior sutures were then placed to complete the anastomosis. The endotracheal tube was pulled back above the suture line, the lung inflated, and the tracheal closure proved air-tight. The collar incision was closed without drainage. A portable chest x-ray in the recovery room demonstrated bilateral pneumothoracies which responded to a single needle aspiration. The nasotracheal tube was left in place for 24 hours, then removed. He was discharged on the sixth postoperative day, and has remained well for the 10 months since surgery.

Pathology: The resected specimen was a homogeneous white-gray polypoid piece of tissue adherent to the tracheal mucosa. Cut section revealed a smooth homogeneity to the tissue without gross evidence of infiltration of tumor into underlying submucosal tissue.

Microscopically the tumor cells were uniform with round homogeneous dark nuclei. The pattern of tumor cells was that of anastomosing cords of cells with formation of many tubular structures by the neoplastic cells. Cystic spaces were frequently found. The tumor invaded the submucosa and completely encircled the cartilage of the tracheal wall without invasion of the perichondruim itself. The serosa was free of tumor. Lymphatic invasion was not identified.

Discussion

Tracheal resection is performed for primary tumors or for strictures due either to external trauma or, more commonly, to prolonged respiratory assist with a cuffed tracheostomy tube.

Although two cases of primary end-to-end tracheal anastomosis were reported prior to 1900,[2,3] the subject lay dormant until 1946. In that year, Belsey[4] reported the reconstruction of a lateral tracheal wall defect with fascia lata, following the excision of a tracheal tumor. Between 1946 and 1960 numerous technics and materials were used to reconstitute the trachea following lateral or sleeve resection. These included bladder mucosa, wire or wire mesh supporting fascia lata or skin, and a variety of prosthetic tubes including steel, Ivalon, Marlex, Polyethylene, Teflon, and Silastic.[5,6,7,8] Unfortunately, none of these devices have been completely satisfactory. Suture line disruption, fistula formation, and infection have been frequent complications.

Over the past ten years Grillo has shown by autopsy, experimental animal work, and clinical studies that up to 6.4 cms of the trachea (nine to ten tracheal rings) can be resected and reanastomosed end-to-end with consistently good results.[9,10] Grillo has reported excellent results using sleeve resection and primary anastomosis in 20 patients with post-tracheostomy strictures and in five patients with tracheal tumors.[10] Only one patient died, due to continued tracheomalacia following resection of a stenosis due to prolonged ventilatory assist with a cuffed tracheostomy tube. Other series, including recent ones from the U.S.S.R., France, and Switzerland have reported similar excellent results with primary anastomosis.[8,11,12]

Grillo has shown that blunt dissection through a collar incision is usually adequate to free the trachea for resection of up to seven rings or 4.5 cms. Mediastinal tracheal tumors are seldom close to the carina and can generally be removed through a collar incision, as was done in this case. If the tumor lies deeper in the mediastinum, a median sternotomy can be used for additional exposure. As many as 10 tracheal rings have been resected with a primary anastomosis.[11] If the carina is involved, the right chest must be opened.[1]

The blood supply to the cervical and upper mediastinal trachea comes from its lateral fascial attachments through branches of the inferior thyroid artery. These vessels also supply the esophagus in the same area. They anastomose distally with branches of the internal mammary and bronchial arteries, which are somewhat inconstant in their distribution.[13] Further anatomic studies of the blood supply of the lower trachea are lacking, but it would seem that its blood supply is more tenuous in the upper portion, since tracheal necrosis has been reported in this area following mobilization of unknown extent. Therefore, in mobilizing the trachea, it is important to maintain the lateral attachments intact.

There inevitably must be some tension on the anastomosis, even after tracheal mobilization. Grillo's autopsy studies of resection limits in the human were based upon using less than 1200 gms of tension to approximate the two ends of the trachea.[14] His clinical success supports such tension as reasonable. Following tracheal resection, Cantrell[15] has shown in dogs that considerably more tension on the anastomosis was compatible with primary healing.

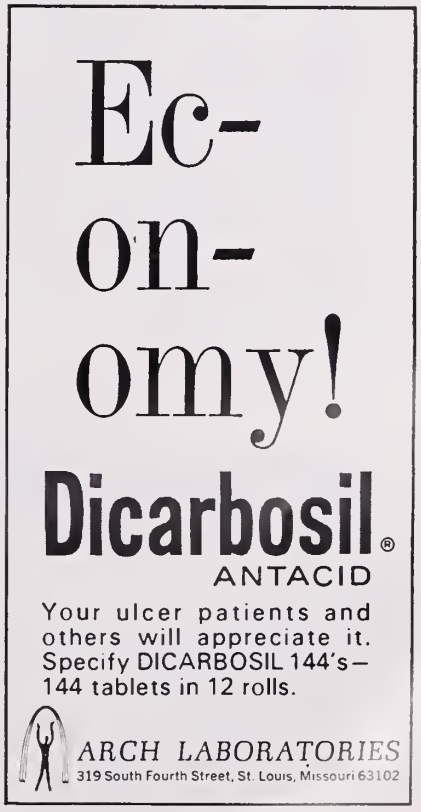
Another approach to gaining more tracheal length to relax tension at the anastomosis has been reported by Dedo and Fishman.[16] They have divided the thyrohyoid muscles and membranes, and divided the upper cornua of the hyoid bone to permit the larynx to be lowered 3.5 cm. This has not affected the voice and may avoid a thoracotomy if adequate approximation can be achieved in this manner.

Maintaining an adequate airway when the trachea is open can be difficult. In the present case, the patient was maintained under light anesthesia, doing his own breathing, for most of the procedure. This made it possible for the patient to continue to ventilate through the open trachea during the time that the trachea was opened until the distal trachea had been intubated. Since the distal tracheal segment may be short, it is best to have an armored intratracheal tube with a narrow cuff near the tip of the tube. This will help prevent intubation of one main stem bronchus and occlusion of the other. Since the anesthesiologist has little control over the tube during this portion of the operation, it is the surgeon's responsibility to maintain the tube in place during the time that the trachea is being resected and sutured.

Both absorbable[8] and nonabsorbable[10] sutures have been used successfully for tracheal anastomoses. Non-absorbable, monofilament suture was selected in this case because it will maintain its strength indefinitely and is relatively inert, compared to braided silk or dacron. The long term fate of monofilament polypropylene in the trachea, however, has yet to be determined.

Unfortunately, taxonomy of adenocystic carcinomas has lead to confusion in diagnosis, especially from the classic mixed tumor of the upper respiratory tract. Adenocystic carcinomas of the trachea must be considered a distinct entity and unrelated to other carcinomas of the respiratory tract because of differences in the natural history and biologic behavior of the various tracheal malignancies. Synonyms for adenocystic carcinoma of the trachea include such poor terms as mixed tumor, cylindroma, adenoma, basaloid adenoma, oncocytoma, primary colloid carcinoma and cystic basal cell adenoma. Adenocystic carcinomas are malignant epithelial tumors that spread by local recurrence and metastases. Their microscopic appearance easily distinguishes them from other neoplastic lesions of the respiratory tract.

Adenocystic carcinomas occur most frequently in the sinuses and nasopharynx of the respiratory tract with only 10 per cent of these tumors occurring in the trachea. Of a series of 5,050 cases of upper respiratory tract tumors, only 100 were primary in the trachea and, of these, only eight were adenocystic carcinomas. The male is more often affected than the female and the common age group to develop this rare tumor is between 40-60.[17,18]



The treatment of choice is surgery as performed in the case reported here. The recurrence rate for this tumor is high, and despite prolonged apparent cures, the prognosis should remain guarded. Adenocystic carcinomas characteristically have prolonged remission periods, as long as ten years. Metastases occur in regional lymph nodes as well as distant metastases to lungs and liver. The rate of metastases is not known as relatively few cases have been reported.

Other forms of treatment, such as endoscopic surgical diathermy or irradiation therapy have usually been followed by recurrence and death.[19] Although surgery is not always curative, its results are better than any of the other types of therapy. In Mathey's[8] series of nine cylindromas treated by resection, two died in the hospital (one from anuria and one from respiratory failure). Three of the seven survivors then died from recurrent tumors, two months, two years, and five years after operation. The other four patients were well from 1-11 years postoperatively. •

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Peripelvic extravasation with acute ureteral obstruction*

Paul J. Dudzinski, MD, James N. Wolff, MD, and Albert F. Petrone, MD, Denver

ALTHOUGH A RARE phenomenon, peripelvic extravasation is occasionally seen following a complete ureteral obstruction. The x-ray image may cause concern to the physician not familiar with the entity. However, this finding should be considered as an extreme degree of pelvic backflow and be basically interpreted as physiologic.

In 1961, Frank Hinman, Jr. described the various types of backflow and outlined the mechanisms in detail. Several investigators have shown that increased intrapelvic and intra-ureteral pressure can produce backflow, however, there seems to be controversy as to how high the pressure has to be before extravasation occurs. More important than the absolute pressure rise is the rate of increase. The more common types of backflow are the pyelolymphatic and the pyelovenous and, for the most part, these can be easily identified on x-ray. The peripelvic extravasation due to a ruptured fornix has a different radiographic distribution and more closely resembles extravasation secondary to trauma. During an acute obstruction the intrapelvic pressure may rise in excess of 100 mm. of mercury. This pressure is transmitted in all directions proximal to the obstruction. Initially, pyelovenous and pyelolymphatic backflow probably occur, following this the collecting system ruptures at its weakest point which is the union of the calyx to the fornix, the fluid then drains into the perihylar area and subsequently around the ureter.

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Diagnosis

Roentgenographically the lesion presents as peripelvic and periureteral extravasation of urine containing contrast media. The extravasation normally extends from the hilum along the length of the upper third of the ureter. It is normally limited to the periureteral area within gerotas fascia due to the easy progress in the lax fatty connective tissue in this compartment. The fluid dissection seldom follows the renal capsule, therefore, the extravasation is almost never perirenal. The appearance of the extravasation is normally a late phenomenon during excretory urography because of the minute size of the forniceal tear. It seldom is clearly seen before the 30 minute film and, even then, may be tenuous enough that it is overlooked.

As Schwartz has pointed out, for the occurrence to be classified as spontaneous, the following criteria must be fulfilled:

1. Absences of recent ureteric instrumentation.
2. Absence of previous surgery.
3. Absence of external trauma.
4. Absence of a destructive kidney lesion.
5. Absence of external compression.
6. Exclusion of cases in which a rent is produced in the ureter or pelvis by pressure necrosis of the stone.

Fig. 1. and Fig. 2. are photographs of intravenous pyelograms illustrating this entity. None of the above factors were present in these two cases.

Fig. 1. 42-year-old male. IVP obtained eight hours after onset of right renal colic. Cause of obstruction, right ureteral calculus in lower one third of ureter. Stone passed spontaneously.

Fig. 2. 29-year-old female. IVP obtained 12 hours after onset of left renal colic. Cause of obstruction left ureteral stone in lower one third of ureter. Stone passed spontaneously.

Treatment

Peripelvic extravasation can normally be treated conservatively. Extravasation will promptly subside once the obstruction is relieved, therefore, primary attention should be directed to relieving the underlying cause. If the cause is a small calculus it can normally be expected to pass spontaneously. Occasionally a manipulation or a ureteral lithotomy may be indicated. If the obstruction is of iatrogenic cause prompt reintervention is necessary. The dangers of extravasation can be immediate or distant. In the case of infected urine the possibility of generalized sepsis is very real. Also, the extravasation could give place to a perinephric abscess. If either of these complications are suspected, prompt drainage should be carried out. The distant or long term danger lies in the possible periureteral fibrosis and peripelvic urine granuloma that may result as a consequence of the extravasation, however, there appears to be little evidence that lasting complication are caused from this minute urine leak.

Conclusion

Two cases of peripelvic extravasation of urine secondary to acute obstruction of the ureter are presented and the basic literature is reviewed. Peripelvic extravasation should be considered as an extreme degree of pelvic backflow and be basically interpreted as physiologic. Treatment for the most part is conservative. •

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Local and regional anesthesia in the office*

Rudolph H. de Jong, MD, Seattle, Washington

Much time and discomfort can be saved with the intelligent and judicious use of local anesthesia in minor surgery in the office and hospital. This paper is most helpful in this regard because it details not only the technic, but is instructive from the standpoint of prevention of error in use.

MINOR OFFICE SURGERY can be made more comfortable for the patient by knowing how and where to block some easily accessible regional nerves. Such blocks, by anesthetizing the structures innervated by the nerve, not only are less unpleasant to the patient than the infiltration of a large area of skin, but take less local anesthetic and so reduce the chance of an untoward drug reaction. Nerve blocks are not at all difficult, requiring chiefly refreshing one's knowledge of the local anatomy. Experience, of course, also will help.

The purpose of this paper is to highlight certain aspects of local anesthesia important to the practitioner, and to call attention to some nerve blocks. I heartily recommend "Regional Block. A Handbook for Use in the Clinical Practice of Medicine and Surgery," by Daniel C. Moore (Chas. Thomas Co.) to the physician wanting to further his skill with nerve blocks.

*Presented at the Wyoming State Medical Society meeting, August, 1969. The author is Associate Professor of Anesthesiology and Pharmacology, University of Washington School of Medicine, Seattle, Washington.

Equipment

Syringes and Needles. Equipment for nerve block need neither be extensive nor expensive, but it should be both clean and sterile. Ordinary syringes, whether of glass or made of disposable plastic are satisfactory. One important requirement is that the syringe permit aspiration so as to ascertain extravascular injection. Aspiration is made much the easier by using a three-ring syringe adapter which permits one-handed maneuvering.

Needles should be sharp so as to penetrate the skin readily. Also, having been on the receiving end of a needle all too often, I like to use the finest needle possible. It is surprising to see how many physicians use a 20 or 18-gauge needle for infiltration where a 22 or 23-gauge needle would suffice. And in many cases a 25-gauge needle permits deposition of a few drops of anesthetic solution into the skin before inserting a larger bore needle. Nowadays, sterile disposable needles are so cheap as to be almost preferable to the cleaning, sharpening and sterilizing of standard needles.

Drugs. Hundreds of local anesthetic solutions have been marketed. My recommendation is to use one drug, become thoroughly familiar with it and, if satisfied with its performance, stick with it. I have found 1 per cent solutions of lidocaine (Xylocaine) or mepivacaine (Carbocaine) very satisfactory for they combine rapid onset of profound anesthesia with reasonably low irritancy and toxicity.

While procaine is excellent for plain subcutaneous infiltration, it does not seem to work as well in nerve block as the aforementioned anesthetics. This may be because procaine does not diffuse as easily through tissues.

Vasoconstrictor. If more than ten or so milliliters of local anesthetic solution are injected, one may wish to slow drug absorption with a vasoconstrictor. Not only is toxicity reduced thereby, thus making injection of larger quantities of drug possible, but other benefits are gained. Of these, two stand out. First, slowing of absorption means that the anesthetic remains in contact with the nerve longer, thereby prolonging duration of anesthesia. Second, by constricting regional arterioles and venules, hemorrhage is reduced, permitting more efficient surgery.

Of the many vasoconstrictors available, only epinephrine has performed consistently well. Surprisingly little is needed, one part epinephrine to 200,000 or 250,000 parts of local anesthetic solution being about optimal. Such a mixture is made by adding 0.2 ml of the standard 1:1000 epinephrine solution to a 50 ml bottle of local anesthetic solution. The same proportions of epinephrine to local anesthetic apply when making more or less solution.

Especially when making up small quantities of solution, the epinephrine should be measured carefully; with a 1 ml syringe for instance. An eye dropper definitely is unsatisfactory, for it is most inaccurate, delivering much more volume than expected. More epinephrine than recommended above will neither slow absorption any more nor provide better hemostasis. To the contrary, annoying epinephrine reactions may be seen.

As epinephrine is oxidized to a brownish inactive product in a few hours, solutions should be mixed fresh each day. Some manufacturers now market epinephrine-containing local anesthetic solutions which have an antioxidant to retard deterioration. The high acidity of such mixtures may make them a bit more irritating than the freshly-mixed solution.

One word of caution. Do not inject solutions with epinephrine near terminal arterioles such as are found in the fingers, earlobes and penis. In these regions, lacking adequate collateral circulation, profound vasoconstriction may lead to tissue damage. Caution, likewise, should be exercised with vasoconstrictors in patients with hypertension and vascular diseases.

Safety Equipment. This subject should perhaps have been broached first, for few physicians give much of a second thought to the potential hazards of local anesthetics. This is because trouble so rarely occurs. But when it occurs it is well to be prepared with a few essential pieces of equipment and a definite plan of action.

Paramount is the ability to support ventilation. It can be accomplished with a minimum of equipment. In most cases, simply delivering oxygen to the patient with a disposable plastic face mask suffices. Should respiratory or cardiac arrest occur, emergency ventilation can be provided with mouth-to-mouth ventilation. Better would be to have a self-inflating bag, mask and valve unit on hand. The complete assembly is sold commercially for less than $100. Other resuscitative equipment and drugs also should be on hand to manage cardiac emergencies.

Regional Anesthesia

Skin Infiltration. This technic is familiar to nearly all physicians, and little additional need be said about it here. Repair of extensive injuries commonly requires much more anesthetic solution than one realizes. Therefore it is good policy to count how many syringe-fulls have been injected.

Two means of avoiding drug overdosage when infiltrating the skin or wound edges are: (1) use a more dilute solution (perhaps ½ or ¼ per cent instead of the usual 1 per cent solution) so as to keep the total drug dose within therapeutic limits, and (2) incorporate epinephrine into the solution as mentioned above. The latter also will reduce hemorrhage. As mentioned too, the finer and sharper the needle for infiltration, the more serene the patient.

Hand injuries being so common makes the providing of good anesthesia for their repair important. While infiltration anesthesia suffices for minor injuries, the irregular surface of the hand and its dense

innervation would require massive injection for more extensive procedures.

Such injection would be time-consuming, set the stage for rapid drug absorption and often is none too satisfactory from the patient's point of view. The two nerve block procedures described below have proved so successful as to be preferred by hand surgeons.

Digital Nerve Block. The nerves supplying the digits run alongside the metacarpals and so are blocked with ease. Injection of three to five milliliters of local anesthetic along each the radial and ulnar faces of a metarcarpal is all that is needed. The preferred approach is from the dorsal surface of the hand, sliding the needle first along one and then the other side of the metacarpal, and depositing solution as the needle advances towards the palm.

Profound anesthesia of the finger and nailbed soon ensues. But it should be remembered that the confining tissue compartments of the hand present a relative contraindication to this technic in the presence of infection.

The almost identical injection, substituting metatarsal for metacarpal, applies to the foot. Metacarpal nerve block of the big toe is sufficiently intense (if done properly) to permit painless operation on the nailbed, for instance.

Wrist Block. The hand and fingers are innervated by the median, ulnar and radial nerves. (A branch of the musculocutaneous nerve may reach the base of the thumb.) As these nerves lie not too far below the skin at the wrist they can be blocked with a short 25-gauge needle.

The median nerve is located just below the lateral edge of the palmaris longus tendon, and the ulnar nerve just lateral to the tendon of the flexor carpi ulnaris. The radial nerve, having often branched already at the wrist, is best blocked by subcutaneous infiltration of anesthetic at the radial side of the wrist, and overlying the radial artery. This procedure simultaneously blocks the occasional terminal branch of the musculocutaneous nerve.

In performing this block, proximity of the needle tip to the median or ulnar nerves is signalled by a paresthesia radiating towards the thumb or little finger respectively. Such a paresthesia indicates that injection will be successful. By using a fine needle and stopping its advancement when a paresthesia is elicited, there should be little fear of intraneural injection. The latter is signaled by a paresthesia during injection. If the patient complains of pain radiating into the fingers during injection, withdraw the needle slightly, then resume injecting.

Though an ankle block is feasible, the nerves there run a more uncertain course. Moreover, postinjection paresthesias, induced evidently by the rubbing of a shoe along the ankle, have been described.

Intercostal Block. While more a therapeutic than a surgical block, this block is a great asset to the family practitioner. Some of my most grateful patients have been those whose pain of rib fracture has been relieved with an intercostal block. Curiously, and not at all well explained yet, is that one or two injections often suffice, allowing the patient to cough freely and carry on with his daily activities.

The nerve is best approached at the angle of the rib where it has not yet branched. The rib surface is contacted gently with the needle and the latter then slid off the lower border of the rib by "walking" it in a caudad direction. Advancing the needle a fraction of a millimeter then pushes it through the posterior intercostal membrane and near the nerve. Deposit five milliliters of solution. Great care should be exercised not to advance the needle too far, for fear of puncturing the pleura.

Intrafracture Injection. Physicians near a ski slope with few facilities on hand may wonder how to set a fracture without resort to general anesthesia, or to make transportation to the nearest center less of an ordeal. This can be accomplished by advancing a needle into the fracture site, aspirating as much blood as possible, then injecting ten or fifteen milliliters of local anesthetic.

While admittedly an emergency procedure that could introduce infection if not performed aseptically, this technic nevertheless

is worth knowing. This is one of the instances where a large bore needle (about 20-gauge) is needed to remove blood from the fracture site.

Paracervical Block. Sometimes it becomes necessary to anesthetize the uterus quickly, as for emergency curettage or delivery. Paracervical injection at "three and nine o'clock" along the cervix and lower uterus is a technic well worth learning—preferably in a hospital at first.

Difficult to describe in words, it comprises in essence deposition of about ten milliliters of local anesthetic at each side of the cervix between the leaves of the uterosacral ligament. By diffusing through the paracervical tissues, the greater portion of the uterine nerve supply is reached, excepting the lateral upper portions of the uterus which are innervated by nerves running with the ovarian vessels.

One hazard with this block is the possibility of intravascular injection or rapid absorption. Careful aspiration to verify extravascular injection is called for, and the addition of epinephrine is recommended. (While epinephrine may slow labor, the small amount added to the local anesthetic appears to be innocuous.) It should be noted too that recent studies suggest rapid drug passage from maternal paracervical space to fetal bloodstream. Paracervical block thus may not be as ideal an anesthetic technic for routine delivery as originally anticipated. •

Legal Advice

The precedent set by the Illinois Supreme Court during September, 1970, when it ruled that hospitals may be held liable for giving patients blood containing the hepatitis virus—even though there is no evidence of negligence—might have been averted if the hospital had asked the patient who brought the action to sign a consent form. The patient, who alleged she contracted hepatitis during a transfusion in 1960, asked $50,000 in damages. Had the patient signed a consent agreement to waive the implied warranty of fitness, the court's decision might have been different, A.M.A. attorneys have pointed out. As protection against possible damage suits, A.M.A.'s Office of the General Counsel recommends that its form, "Agreement for Blood Transfusion," be used by hospitals and physicians. The form, No. 34, is included in A.M.A.'s "Medicological Forms with Legal Analysis." If the patient signs such a waiver and is informed of possible risks associated with transfusions, he assumes any implied risk other than those involving negligence, according to A.M.A. attorneys. A.M.A. warned as early as 1957 of the possibility that courts may hold hospitals and blood banks to be insurers of the quality of blood they receive. A.M.A.'s consent form was drafted to comply with the Uniform Commercial Code of the Uniform Sales Act.—"A.M.A. Newsletter."

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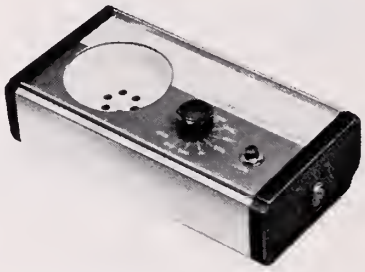

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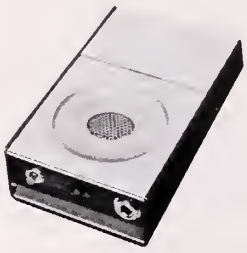

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Medicine and Stamps, R. A. Kyle, MD, and M. A. Shampo, MD, 77 (June)

Preparation for Childbirth, Donna and Rodger Ewy, 59 (Nov.)

Psychiatry and the Criminal, John M. MacDonald, MD, 61 (April)

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Bramley, James R. (Colorado) 9 (Dec.)

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Cragun, W. Ezra (Utah) 64 (May)

Crowder, Earl R. (Utah) 58 (Nov.)

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Dunham, James Isaac (New Mexico) 64 (May)

Dunlap, Lawrence G. (Montana) 61 (Oct.)

Earhart, Henry Troy (Colorado) 56 (Nov.)

Gauss, Harry (Colorado) 60 (March)

Georges, Samuel W. (Utah) 9 (Dec.)

Gold, Morris Alan (Montana) 59 (Jan.)

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Harrington, John F. (Colorado) 60 (Oct.)

Heetderks, Bernard John Sr. (Montana) 76 (June)

Howlett, Louis U. (Colorado) 65 (July)

Katzman, Maurice J. (Colorado) 65 (July)

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Towne, Ralph Leonard (Montana) 57 (Nov.)

Weight, Jesse J. (Utah) 65 (July)

Wernham, James Ingersoll (Montana) 59 (Jan.)

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6-12 mo. .. ½ tsp. q.i.d. (4 mg.)
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2-5 yr. ... 1 tsp. t.i.d. (6 mg.)
5-8 yr. ... 1 tsp. q.i.d. (8 mg.)
8-12 yr. .. 1 tsp. 5 times daily (10 mg.)
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Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (e.g., excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship has not been established clinically.
Adverse Reactions: Drowsiness, ataxia and confusion may occur, especially in the elderly and debilitated. These are reversible in most instances by proper dosage adjustment, but are also occasionally observed at the lower dosage ranges. In a few instances syncope has been reported. Also encountered are isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent and generally controlled with dosage reduction; changes in EEG patterns (low-voltage fast activity) may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice and hepatic dysfunction have been reported occasionally, making periodic blood counts and liver function tests advisable during protracted therapy.

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